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ECONOMIC MINERALS

OF

NOVA SCOTIA

CATALOGUE AND DESCRIPTION

OF A COLLECTION AT THE

DOMINION EXHIBITION,

HALIFAX.

PREPARED UNDER DIRECTION OF

THE DEPARTMENT OF PUBLIC WORKS AND MINES

BY HARRY PIERS,
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ECONOMIC MINERALS OF NOVA SCOTIA.

The following brief descriptive notes have been prepared to accompany a permanent collection of the economic minerals and mineral products of Nova Scotia made under direction of the Department of Mines for the Provincial Exhibition at Halifax. The collection was brought together in 1903 for the exhibition of September of that year, and has since been added to from time to time. It is trusted it will show the diversity and general characteristics of most of the better known, and more or less workable mineral deposits of the province. The catalogue also contains some particulars regarding special exhibits permanently placed in the general exhibit by various mining companies, and this includes a couple of smelting companies which, although they just at present employ ore from abroad, yet use large amounts of local flux material, coke, etc., and from time to time treat our own ores. It has been thought better not to include in a permanent catalogue a few transient specimens, such as rich gold samples, loaned for the occasion, but they will be found fully labelled.

As an indication of the constituents and character of the minerals, analyses accompany most of the descriptions. The reader, however, must remember that analyses are sometimes misleading if they have been made from picked samples, as is not infrequently the case.

To further illustrate the collection, there accompanies it a large number of photographic views of mining plants, shaft houses, quarries, etc., each fully labelled; and likewise geological maps, plans and sections.

It may be mentioned that the Government also maintains a large collection of the minerals of Nova Scotia in the Provincial Museum, where may be seen specimens of all species discovered in the province, whether of economic or scientific interest, and from a very large number of localities. The same institution also has a large series of rock samples illustrating the various geological formations of the province. These specimens are available at all times for examination by the miner or scientific student. Literature on the subject is accessible to the public in the Provincial Science Library in connection with the Museum.

COAL.

The coal of Nova Scotia is bituminous, and in many cases coking, resembling the coals of the north of England. The total output of the province for the calendar year 1905, was 5,279,621 long tons, being over 60 per cent. of the entire coal output of Canada for the year.

SYDNEY COAL-FIELD.

The Sydney coal-field, in the county of Cape Breton, was the first opened in Canada. The French extracted some coal here in the eighteenth century, and as early as 1785 work was done here by the English government. In 1827 systematic and regular mining was begun by the General Mining Association. The coal-field has been long known for its excellent steam coals, which are largely used for domestic purposes, coke, gas-making, etc. The area of the field, which is not yet fully explored, is about 400 square miles. It contains a number of large seams favorably situated for mining, and is on tide water. With it may be associated the New Campbellton areas in Victoria Co.

1. BITUMINOUS COAL. Phalen seam, Dominion Coal Co's. collieries, Glace Bay, C. B. Co.—This company is too well known to require more than a brief account of it and its operations. It operates under a lease of 99 years, the royalty to the N. S. Government for the whole period being at a minimum of 12½ cents per ton, with a minimum gross amount for each year to be paid on at least as many tons as were in 1891 sold by all the mines included in the new company. It has control of the Glace Bay section of the Sydney coal-fields, where it works the Phalen (8 ft.) and Harbor (6 ft.) seams on a large scale. and also the Hub (9 ft.) and Emery. The following collieries are in operation:—No. 1, (on Phalen seam), No. 2 (on Phalen seam), No. 3 (Phalen seam), No. 4 or Caledonia, (Phalen seam,) No. 5 or Reserve (Phelan seam), No. 6 (a new colliery on Phelan seam), No. 7 or Hub (Hub seam), No. 8 or International (Harbor seam), No. 9 (Harbor seam), and No. 10 (Emery seam). These collieries are up to date in every respect, the pits being supplied with all modern improvements in the way of endless haulage, compressed air for pumps and mechanical coal-cutters, fans, picking tables, etc; and there are also 3 Robinson-Ramsay coal-washers, with a combined capacity of 2,000 tons daily. The company's railway connects the mines with the I. C. Railway, the Dom. Steel Co's furnaces, and shipping piers at Sydney Harbor and Louisburg (40 miles of main track). The output for July 1906 of Dom. No. 5 (Reserve), was 59,298 tons; of No. 2, 52,701 tons; and of No. 1, 45,266 tons. The total output of all the collieries for the calendar year 1905 was 3.271,401 tons of 2240 lbs. The seams are worked "room and pillar." The following analyses show the character of the seams in this district:—

	PHALEN SEAM			HARBOR SEAM
	at Dom. No. 2.	at Caledonia.	at Reserve.	at International.
Vol. combustible matter	32.45	30.85	30.75	37.30
Fixed carbon.........	61.45	62.05	63.70	56.90
Sulphur............	1.99	2.32	1.81	3.11
Ash................	5.25	6.40	4.65	5.10
Moisture............	.85	.70	.90	.80

The Phalen seam yields 11,012 cubic ft. of gas per long ton having an average calorific power of 571.85 B. T. U. and an average illuminating power of 9.9 candles and with a Welsbach burner, 54.34 candles. The total yield of coke is 74.68 per cent. ; the ammonium sulphate per ton amounts to 32.91 lbs. the tar, 12.89 gals. ; and the benzole, 103 gals.

The company shows a section of the Phalen seam, from roof to pavement, taken from the Reserve Mine. The section is 7 ft. 9 in. in height, weighs 2¼ tons, and shows the good quality of this seam as a whole.

2. COKE. Made from Dominion Coal Co.'s coal, at Dominion Iron & Steel Co.'s ovens, Sydney C. B. Co., and used in the latter company's blast furnaces.

3. COAL BRIQUETTES. Dominion Coal Co., Glace Bay, C. B. Co. —The company formerly had a plant for making these briquettes from slack coal, but it is now disused.

4. BITUMINOUS COAL, VAR. PEACOCK COAL. Dominion Coal Co.'s Hub seam, Hub colliery, Glace Bay, C. B. Co. Beautiful specimens of this iridescent coal have been taken from this mine.

5. BITUMINOUS COAL. Main seam, N. S. Steel & Coal Co.'s colliery, Sydney Mines, C. B. Co.—The Point Aconi and Sydney Mines areas of this company consist of 11,709 acres, which contained in 1871, according to the estimate of R. Brown, 155,000,000 tons of coal; and the Sydney Mines submarine areas of 3,200 acres, which contained in 1871, according to the same authority, 66,000,000 tons of coal. Since that date about 5,000,000 tons have been mined from these areas. The main seam at Sydney Mines is 5 ft. 4 in. thick, Besides its older, or No. 3 shaft, the company recently opened two new mines known as Sydney No. 1 and Sydney No. 2, but the last (No. 2) was closed in October, 1904. The workings now extend far beneath the sea, the cover there now being about 1,000 ft of strata. The collieries are well equipped and the output for 1905 was 504,126 tons. The coal is excellent for house use and makes good coke. The following analyses will serve to indicate the character of the main seam :—

Moisture	1.536	1.92
Volatile combustible matter	36.362	36.27
Fixed carbon	57.008	57.05
Sulphur	1.894	2.01
Ash	5.084	4.76

6. BITUMINOUS. COAL Gowrie seam, Gowrie & Blockhouse collieries, Port Morien, C. B. Co.—This company is the successor of the coal syndicate of Newcastle-on-Tyne, and the royalties acquired cover about 8 square miles, embracing several seams of importance. A shaft 205 feet deep has been sunk to the Gowrie seam, and the coal proved to be 5 ft. 2. in. thick and of excellent quality. The shaft level has been driven in and stone drift set away to the new submarine workings, and active development is now in progress. Output in 1905 was 39,981 tons. An analysis of Gowrie coal is as follows:—

Vol. combus. matter	36.00
Fixed carbon	57.70
Ash	5.20
Sulphur	3.82
Moisture	1.10

7. BITUMINOUS COAL. Main seam, Cape Breton Coal Mining Co's colliery, New Campbellton, Victoria Co.—Coal was worked here as early as 1861, but the present owners acquired the property (area of 3 miles), in 1893. A 4-ft. seam is worked; dip, 12°; opened by a slope, 1,800 ft., worked "pillar and room." Ingersoll coal-cutting machines are used. The colliery is connected by a 3-ft. gauge railway, 1½ miles long, with the shipping wharf at the mouth of the Big Bras d'Or Lake. The output for 1905 was 4,033 tons. The chief market is in Nova Scotia and Newfoundland. An analysis of the coal is as follows:—

Vol. combus. matter	35.50
Fixed carbon	51.55
Ash	8.95
Sulphur	5.50
Moisture	4.00

8. BITUMINOUS COAL. No. 3 or Indian Cove seam, Sydney Coal Co's colliery, Indian Cove, Sydney Mines, C. B. Co.—The seam worked here measures 4 ft. 2 in. in thickness, and is near the base of the coal measures as defined by the geological survey. The coal is won by a tunnel or slope driven on the strike 2,400 feet. Natural drainage and ventilation. The output for 1905 was 4,295 tons. The haulage is by tail-rope system. This seam is said to have been worked by the French in the early history of the province.

INVERNESS COAL-FIELD.

Work on some of the coal areas in this field was carried on as far back as 1866, and in places the operations were on a somewhat large scale, but subsequently very little work was done until about 1900, when railway communication was established. There are collieries at Port Hood, Mabou and Broad Cove at present working on important deposits of coal. These mines, comparatively recently opened, are rapidly increasing their output and will soon produce an important percentage of the provincial sales. These three collieries during the calendar year 1905 had an output of 185,244 long tons. At Chimney Corner other workable seams occur. The coals are abundant in this part of the Island of Cape Breton, and of good quality, and close to tide waters, while they also have railway facilities.

9. BITUMINOUS COAL. Main seam, Port Hood Coal Co's colliery, Port Hood, Inv. Co.—This company's property comprises 16 square miles at Port Hood. The company's slope, known as the "Lawson slope," is being worked at a depth of about 700 ft. The seam is 6 ft. 11 in. thick, and is free from slate bands and partings. Other seams exist on the property and will be eventually developed. The output for 1905 was 26,155 tons. An analysis of the coal is as follows:—

Moisture	3.85
Volatile combus. matter	35,60
Fixed carbon	53.50
Sulphur	2.84
Ash	7.05

10. BITUMINOUS COAL. Seven-feet seam, Inverness Railway & Coal Co's. colliery, Broad Cove, Inv. Co.—This company has under development some 45,006 acres of areas contiguous to railway. The operations of the company during 1902 were largely confied to development, installation of additional plant, construction of shipping pier, etc. During the year 1905, 175,848 tons of coal were produced and 124,548 tons sold. Average thickness of seam worked, 7 ft.; length of slope No. 1 is 1,366 feet. Eight seams are reported in this district, running in thickness from 2 ft. to 12 ft. Analysis of 7-ft. seam:—

Vol. combust matter	45.55
Fixed carbon	47.09
Ash	7.36
Sulphur	4.91

PICTOU COAL-FIELD.

This district, situated near New Glasgow, has, so far as exploratory work has been carried, an area of about 35 square miles.

Boreholes have been driven near Trenton in order to show that the seams of this district underlie newer rocks as far as Pictou, which would give an area of many hundred square miles. There are a number of collieries here, operated by the Acadia, the Intercolonial, and the Nova Scotia Steel and Coal Companies. The coal is used for the same purposes as that from the Sydney coal-field.

11. BITUMINOUS COAL. Acadia Coal Co., Westville and Stellarton, Pict. Co.—This company owns 16 sq. miles of areas, and has the following well-known collieries: the Acadia at Westville (on Acadia Main seam, 10 ft., dip 27°, slope 4,550 ft. long), and the Albion at Stellarton (noted for the thickness of its seams—the Albion Main being 38 ft., and 148 ft lower, the Deep, 22 ft. thick, also the Third 13 ft thick and McGregor). The Albion colliery includes the Foord pit on the Main seam (38 ft.), used since the explosion as a pumping station; No. 2 slope, on the Third seam, 12 ft., 2,800 ft. long, dip 22°, (Cage pit or Deep seam, 20 ft., is worked from this slope); and the McGregor slope, seam 15 to 20 ft., slope 4,500 ft. to bottom of basin. The Allan, a new shaft; has recently been sunk to the Albion main seam. The Vale Colliery is 6 miles east of New Glasgow, slope 2,400 ft. long, on the Six-feet seam. The various colleries have a large plant and are connected with the Intercolonial Railway. The total output for 1905 was 516,131 tons and a quantity of coke was made. Chief markets—Nova Scotia, Quebec and United States. The coals of Pictou district are less bituminous than those of Cape Breton. They are good steam coals and well adapted for use in iron works, etc., and are largely used for domestic fuels. The following analyses will give an idea of their composition:—

	Acadia.		Deep.	McGregor.	Third.
Vol. combus. matter	29.20	28.09	20.34	28.37	30.69
Fixed carbon	61.15	60.77	68.50	61.13	53.34
Ash	7.55	9.99	10.41	10.50	15.97
Sulphur	1.48	1.24	.94	1.43	1.37
Moisture	2.10	1.15	.75	....	....
Theo. evaporative power	8.50	....	9.39	....	....

12. BITUMINOUS COAL. Main seam, Intercolonial Coal Co.'s Drummond colliery, Westville, Pict. Co.—The coal areas of this company comprise 7¾ sq. miles. The main and second seams are worked, the third and fourth being intact. The second seam is only being opened up. There are two slopes, average dip 16°, length 6,600 ft., one of which is used for hoisting coal, the other for lowering and raising men, etc. The seam is worked on the "long-wall" system, and no explosives are used, the coal being brought down by maul and wedge. The company also have 20 bee-hive coke ovens, with a Robinson coal-washer, and in 1905 began the manufacture of fire-brick. During the year 1905 230,943 tons of coal were raised, and a quantity of coke made. The chief markets are in Nova Scotia, Quebec and Prince Edward Island. The "main seam" (which is also worked by the neighboring Acadia colliery), has been analyzed with the following results:—

Moisture	1.52	.72
Vol. combust. matter	29.46	25.73
Fixed carbon	60.19	65.36
Ash	9.10	8.20
Sulphur	1.62	1.10
Theo. evaporative power	8.24	...

CUMBERLAND COAL-FIELD, ETC.

This large and still partly unexplored district probably covers about 350 square miles. The principal operations are at Springhill, where the Cumberland Coal and Railway Company operates mines yielding between four and five hundred thousand tons a year. Smaller collieries are found extending from the Joggins to the Styles mines, a distance of about 20 miles. The coals are bituminous and coking, and are largely used on locomotives in the lower provinces. Efforts are being made to discover by bore-holes, coal seams underlying the Permian rocks of Cumberland Co.

Coal beds are known at many other localities, but have not been worked except at DeBert and Kemptown, near Truro. At the former place exploratory or development work was recently in progress.

Cannel coal, oil-shales, etc., occur in different districts, but as yet have received little attention.

13. BITUMINOUS COAL. Cumberland Railway & Coal Co., Springhill Cumb. Co.—At Springhill, three seams, from 6 to 14 ft. in thickness are extensively worked, the output for 1905 being 477,254 tons. Chief market are New Brunswick, United States, and Nova Scotia. The colliery is well equipped with modern appliances. No. 2 slope is 3,000 feet in length and works a seam 10 ft. 6 in. thick; No. 3 is 3,200 ft. and works a 10 ft. seam, Coal shipments are made via Springhill Junction (I. C. R.), and by vessels from Parrsboro. The coal has has the following average analysis:—

Volatile combustible matter	34.51
Fixed carbon	58.64
Ash	6.85
Sulphur	1.59

14. BITUMINOUS COAL. Scotia Colliery, Maccan, Cumb. Co. This mine which is owned by Messrs. Ripley and Blenkhorn, raised in 1905, 2755 tons of coal.

15. BITUMINOUS COAL. Maritime Coal Co.'s Chignecto mine, Chignecto, Cumb. Co.—This colliery was re-opened in 1902, and after some initial trouble the mine was unwatered and put in order. At the bottom of the slope, which was in 1902 about 600 feet deep, the top coal measured 3 ft. 6 in., and the bottom coal measured 5 ft.

6 in., separated by 1 ft. 3 in. of fire-clay. There is a third seam of good coal 2 ft. 6 inches thick, overlying what is termed the top coal, which has not been worked. It is separated from the top coal by 4 ft. of fire-clay. The company intends sinking continuously until it reaches 1,400 ft. from the surface. The output in 1905 was 38,667 tons.

Analysis :—

Vol. combus. matter	39.75
Fixed carbon	48.75
Ash	9.95
Sulphur	6.02
Moisture	1.55

16. Bituminous Coal. Minudie Coal Co.'s colliery, River Hebert, Cumb. Co.—This company's areas comprise about 314 acres at River Hebert, opened by two slopes. The production in 1905 was 32,376 tons.

Analysis :—

Vol combus. matter	36.15
Fixed carbon	52.45
Ash	9.60
Sulphur	5.04
Moisture	1.80

17. Bituminous Coal. Milner seam, Strathcona Coal Co.'s colliery, River Hebert, Cumb. Co.—This colliery has now a slope of over 460 ft. The coal is reported to be improving in quality with depth. New bankhouse, screens, and engine house have recently been built ; 9,673 tons of coal were raised in 1905. The following is an analysis of this coal :—

Volatile combustible matter	37.36
Fixed carbon	52.25
Ash	10.39
Sulphur	4.47

18. Bituminous Coal. Strathcona seam, Strathcona Coal Co.'s colliery, River Hebert, Cumb. Co.—This is from a seam discovered on the company's property a few years ago, and the sample shown is from close to the surface, out of a trial pit. The seam is 3 ft. 6 ins. thick ,with 2 ins. of clay parting in centre.

19. Bituminous Coal. Canada Coals & Ry. Co.'s Joggins colliery, Joggins Village, Cumb Co.—This company controls an area of 12 sq. miles. Colliery connected by rail with Intercolonial Ry., and a shipping wharf on Chignecto Bay. Seam from 4 to 5½ ft. thick ; dip 17 ; slopes, 2700 and 2500 ft. respectively. The output for

1905 was 53,807 tons. The coal is chiefly marketed in New Brunswick and Quebec. The following is an analysis of Joggins coal :—

Volatile combustible matter	40.89
Fixed carbon	48.33
Ash	10.78
Sulphur	5.72

20. BITUMINOUS COAL. Colchester Coal & Ry. Co., DeBert Mountain, Col. Co.—The sample shown is from about 23 ft. below the surface, from a seam 6 ft. 2 in. thick, 20 inches of which is fire-clay. The company is putting down two slopes to test their coal, one being driven about 100 feet and the other 205 ft.

21. BITUMINOUS COAL. Wm. J. Murdoch's farm, about ½ mile N. E. of Gore, P. O., Hants Co.—This is from a small 8 inch seam of coal in Lower Carboniferous or Upper Devonian slates, which has been prospected by Wm J. Murdoch and associates.

BY-PRODUCTS OF COAL.

22. COAL TAR PRODUCTS. Dominion Tar & Chemical Co. Sydney, C. B. Co.—The manufacture of these products is a new industry in this province. The company has a plant near the works of the Dominion Iron & Steel Co., from whose coke-ovens it obtains its supply of coal tar. From this it manufactures refined tar roofing cement black varnish (for smokestacks, bridgework, etc), crude naptha, light oil, carbolic acid, creosote oil, shingle stains of various tints, soluble disinfectant (a disinfectant, deodorizer, and antiseptic for use in hospitals, residences. stables, etc.), roofing pitch, briquetting pitch, paving pitch, and target pitch

The following tables show the coal production by companies and the trade by counties for the year ended, September 30 1905 :—

PRODUCTION AND SALES BY COLLIERIES, NOVA SCOTIA, FOR YEAR ENDED SEPTEMRER 30TH, 1905.

COLLIERY.	PLACE.	PRODUCTION.	SALES.	COLLIERY CONSUMPTION.	
				Engines.	Workmen.
Maritime Coal Co	Maccan, Cumberland Co......	38,667	32,949	3,687	1,383
Fundy Coal Co	Lower Cove, "	2,227	1,493	417	97
Canada Coal and Railway	Joggins, "	53,807	37,620	10,501	1,852
Minudie Coal Co	River Hebert, "	32,376	29,981	1,377	967
Ripley & Blenkhorn	Maccan, "	2,755	2,240	245	140
Prospect Coal Co..............	River Hebert, "	4,757	3,492	1,259	256
Strathcona Coal Co.	River Hebert, "	9,673	7 326	985	362
Cumberland Railway and Coal Co.	Springhill, "	477,254	412,109	44,240	13,265
Acadia Coal Co	Westville, Pictou Co	316,131	255,332	50 532	7,805
Intercolonial Coal Co	Westville, "	230,943	197,897	19,062	5 185
Nova Scotia Steel and Coal Co....	Marsh, "	46,052	42,083	3,869	100
Dominion Coal Co.	Glace Bay, Cape Breton Co,....	3,076,107	2,780 293	156 982	21,683
Gowrie and Blockhouse Collieries.	Port Morien, "	39,981	32,182	7,839	978
Nova Scotia Steel and Coal Co ...	Sydney Mines, "	504,126	484,194	26,423	11,871
Sydney Coal Co................	North Sydney, "	4,295	4.638	56	133
Cape Breton Coal Mining Co.....	New Campbellton, Victoria Co..	4,033	3,375	545	430
Port Hood Coal Co	Port Hood, Inverness Co	26,155	22,557	6,812	1,208
Mabou Coal Co	Mabou Mines, "	5,233	975	3,441	881
Inverness Coal and Railway Co...	Broad Cove, "	175,848	124,548	17,[illegible]1	3,207
Total	....	5,050,420	4,475,284	355,534	71,303

COAL TRADE BY COUNTIES, NOVA SCOTIA, FOR THE YEAR ENDED SEPTEMBER 30TH, 1905.

	CUMBERLAND.	PICTOU.	CAPE BRETON.	OTHER COUNTIES.	TOTAL.
Nova Scotia —By land	146,352	304,462	610,914	32,236	1,093,964
By sea	1,226	15,465	497,475	43,605	557,771
Total Nova Scotia	147,578	319,927	1,108,389	75,841	1,651,735
New Brunswick	244,017	34,841	111,940	21,171	411,969
Newfoundland			136,195	1,925	138,120
Prince Edward Island		25,276	39,217	10,643	75,136
Quebec	70,403	115,268	1,265,087	41,641	1,492,399
West Indies			2,524		2,524
United States	65,212		587,139	187	652,538
Other countries			50,816	47	50,863
Total	527,210	495,312	3,301,307	151,455	4,475,284

GOLD.

The gold-fields of Nova Scotia extend from Canso to Yarmouth, and cover, exclusive of the masses of intrusive granite, about 3,000 square miles. The labours of Mr. Faribault, of the Canadian Geological Survey, have presented us with maps and sections and descriptions of that part lying to the east of Halifax, and there are numerous other books and papers treating of our auriferous measures.

The gold-field strata, supposed to be of Lower Cambrian age' have been folded into numerous undulations having a general east and west course, and north and south dips. In these undulations, interstratified with the rocks, are the gold-bearing quartz veins. These interbedded veins, owing to the denudation of the crests of the anticlinals or undulations, are seen in long elliptical outcrops, while underneath are similar veins, not seen at all on the surface. Where these lower veins untouched by denudation, pass over the axes of the anticlinals, they thicken, forming "saddle backs," due to the favoring conditions of the strata. The attention of our gold miners is at present directed to the problem of the best way of attacking and working these saddleback veins, and it is anticipated that, by their sympathetic exploration, gold mining in Nova Scotia will receive a long desired stimulus.

In addition to these intercalated veins there are others (fissure veins) cutting the strata, which have been successfully worked.

Gold is plentiful in the surface earth of many districts. In many cases it should be washed or run through a crusher.

The gold of Nova Scotia, which has a fineness of over 900 parts, occurs as free gold in quartz with sulphides of various metals. It is extracted in stamp-mills, and the residuum treated for the gold lost in the mills.

There are a number of districts scattered through the counties of Guysboro, Halifax, Hants, Colchester, Lunenburg, Queen's and Yarmouth.

From 1862 to 1905 inclusive, Nova Scotia has produced 834,702 ozs. of gold, valued ($19 an oz.) at $15,859.345. This was obtained from 1,688,649 tons of quartz, being an average yield of 9 dwt. 22 grs. per ton.

The following tables show the total yield of gold per district and the district yield for the year ended September 30th, 1905 :—

PRODUCTION OF GOLD, NOVA SCOTIA, FROM 1862 to 190

DISTRICT.	TONS CRUSHED.	TOTAL YIELD OF GOLD			AVERAGE YIELD OF GOLD PER TON.			VALUE $19 PER OZ.
		OZ.	DWT.	GRS.	OZ.	DWT.	GRS.	
Cariboo & Moose River from 1869.	179090	53423	17	3	....	5	23	$1015053
Montagu	28939	41864	15	23	1	8	22	795431
Oldham	52394	56139	1	3	1	1	10	1066642
Renfrew	52149	44991	7	19	....	17	6	854837
Sherbrooke (Goldenville)	294846	152055	4	2	....	10	7	2889049
Stormont (Isaac's Har., Up. Seal Har., etc	305795	86334	11	6	....	5	15	1640356
Tangier........................	50542	23921	16	19	....	9	11	454515
Uniacke from 1866	62971	43438	9	8	....	13	19	825331
Waverley	155520	69980	10	16	....	9	0	1329630
Brookfield from 1887......... ..	92754	38441	3	22	....	8	7	730383
Salmon River from 1883	118440	41699	10	20	....	7	1	792292
Whiteburn from 1887	6831	9757	14	2	1	8	14	185396
Lake Catcha from 1882	26724	26351	17	3	1	19	17	500685
Rawdon from 1887	12189	9606	5	10	....	15	18	182519
Wine Harbour.................	70205	33561	16	11	....	9	13	637674
Fifteen Mile Stream from 1883...	36456	17058	15	5	....	9	8	324116
Malaga	20896	19293	11	7	....	18	11	366578
Other Districts	121908	66781	18	15	....	10	23	1268858
Total..........................	1,688,649	834,702	7	2		9	22	$15,859,345

GENERAL GOLD STATEMENT, NOVA SCOTIA, FOR YEAR ENDED SEPTEMBER 30TH, 1905.

DISTRICT.	TONS CRUSHED.	TOTAL YIELD OF GOLD.			AVERAGE YIELD OF GOLD PER TON.		
		Oz.	Dwt.	Grs.	Oz.	Dwt.	Grs.
Stormont	28882	3316	6	16	....	2	7
Sherbrooke	4729	1053	1	20	....	4	1
Renfrew	512	36	5	....	....	1	10
Wine Harbour	2251	452	10	....	....	4	....
Leipsigate	5503	2239	8	....	....	8	3
Harrigan's Cove	65	15	....	....	....	4	15
North Brookfield	12657	4866	19	4	....	7	16
Waverley	....	2	4	15	....	....	....
Caribou	13998	1319	1	10	....	1	21
Oldham	1187	1401	9	18	1	3	15
Uniacke	38	99	11	15	2	12	10
Lake Catcha	56	64	18	15	1	3	5
Kemptville	120	87	16	....	....	14	15
Other districts	1727	595	1	13	....	6	21
Total	71725	*15549	14	6	....	4	8

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* This total does not include the Gold contained in the Stibnite Ore mined at West Gore, Hants Co. From joint assay made by buyer and seller, 527 tons and 519 pounds of mixed ore shipped during fiscal year contained 1232 ounces, 16 dwts., 23 grains of gold, valued at about $24,000. For the total production of ore, see full report on Dominion Antimony Company contained in the Annual Report of Mines Department of Nova Scotia for 1905, p. 69. It should be stated that, at present, the operators do not receive more than half the value of the gold contents of the ore.

23. **AURIFEROUS QUARTZ.** **Richardson belt, Boston-Richardson Mining Co.'s mine, Upper Seal Harbor district, near Isaac's Harbor, Guys. Co.**—This exhibit has been selected for the purpose of showing characteristic specimens of the different varieties of ore found in the mine. The specimens have been assayed and are marked with the location in the workings from whence they came. A model of the mine is also shown. This company is working the well-known Richardson belt, which varies from 6 ft. to 20 ft. thick, on the curve of the eastern pitch of the dome of the Upper Seal Harbor anticline, the anticline upon which the Dolliver Mountain Co. was operating further to the westward. The company has a good plant, and is applying the most approved methods for the extraction of the gold from its large lead.

24. **AURIFEROUS QUARTZ.** **Dolliver Mountain Mining and Milling Co.'s mine, Upper Seal Harbor district, Guys. Co.**—This company's property, which is situated near Isaac's Harbor, includes a large water power and had an electrical plant, the first to be installed in the gold-fields of the province. A borehole about 500 feet deep was put down a few years ago in the lower workings to prospect the underlying strata. The mine was closed a year or so ago, and part of the plant has been removed. Ore is also shown from a depth of 500 ft., to which depth the workings had gone.

25. **AURIFEROUS QUARTZ.** **Bluenose Gold Mining Co.'s mine, Goldenville, Guys. Co.**—This company was lately engaged in extensively opening up a number of underlying saddle-veins on the anticline, but is now understood to be temporarily closed. Over 55 interstratified veins have been worked or uncovered in the well-known Goldeville district near Sherbrooke, on the northern side of an anticlinal dome pitching to the west; and some 50 veins on the southern side, and other saddle-veins which do not reach the surface are encountered as the workings descend on the axis of the anticline. Portions of special enrichment are met with along certain lines forming well-defined pay zones. In many cases series of veins lie near enough to each other to be worked together. An excellent glass model of this district has been made by E. R. Faribault of the Geological Survey, and is the property of the Mining Society of N. S., and it well illustrates the structure of a typical dome formation. The whole Sherbrooke district, down to 1905, has produced 152,055 oz.

26. **AURIFEROUS QUARTZ.** **Nova Scotia & Mexican Mining Co.'s mine, Goldenville, Guys. Co.**—This company, which is operating what was known as the Stuart-Hardman property, between the Bluenose and Royal Oak Cos. has installed a new plant, and is sinking a vertical shaft from which the veins for a considerable distance across the measures will be developed.

27. **AURIFEROUS QUARTZ.** Royal Oak Mining Co.'s mine, Goldenville, Guys. Co.—The whole north-western turn of the anticlinice is being comprised in the operations of this company, which is enlarging its milling capacity and plant and developing its areas. Some six shafts are on the property and a large stamp mill. The areas adjoin those of the Nova Scotia and Mexican Co.

28. AURIFEROUS QUARTZ. Wine Harbour, Guys. Co.—All the veins uncovered and operated in this district are interstratified ones situated on the south dip of an anticlinal dome The dip of the veins in the main portion of the district is about 80°. The specimen is from a rich shoot of ore worked on the Plough lead. The Old Provincial mine is now in operation, and it is probable that the workings will extend into the Plough Lead mine. The Wine Harbor district down to 1905 has produced 33,561 oz., and some of the veins have been heavy yielders.

29. AURIFEROUS QUARTZ. R. Dickson, Strathcona mine, Forest Hill Guys. Co.—The sample shown is from the School House Lead, at depth of 285 feet. Lead from 8 to 14 inches wide. Two shafts are on this lead, one now down about 345 feet, the other 250 feet The best month's return was 352¾ ozs. for the one month's work, and the poorest month about 94½ ozs. Crushing is done in a 10-stamp mill.

30. AURIFEROUS QUARTZ. Baltimore & Nova Scotia Mining Co.'s mine, Caribou Hx. Co.—This company is working on a large ore-shoot, said to be a fissure deposit, on the old Guffey-Jennings property at the eastern end of the district. The workings have reached a vertical depth of over 800 feet. Several interbedded veins have been uncovered on both sides of the elliptical dome forming the Caribou district, but only a few have been operated to any extent. The most important mining operations have taken place on four fissure veins cutting the stratification at small angles. Two of these have proved to be steady producers, one of them being the vein worked by the Baltimore & N. S. Co. The Caribou district, down to 1905, has produced including Moose River, 53,423 ozs.

31. AURIFEROUS QUARTZ. H. Sanders, Caribou, Hx. Co.—This sample is from the above-mentioned property.

32. AURIFEROUS QUARTZ. Fifteen Mile Stream, Hx. Co.—The samples are the property of the Mines Department.* This district down to 1905 has produced 17,078 oz

33 AURIFEROUS QUARTZ. Waverley Gold Mining Co.'s mine, Waverley. Hx. Co.—The specimens shown are from the famous

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* The specimens to which the Mines Department's name is affixed, are from the D[illegible]

"barrel-lead" lately worked by the above company. Samples are also shown from the Mines Department collection.

Over 60 interstratified veins have been uncovered in this district on the western pitch of an anticlinal dome extending for a length of about 6,000 ft. and a width of 1,500 ft. Several veins have been mined extensively. Series of parallel veins on the north dip lie near enough to each other to be advantageously worked together. This district has produced down to 1905 69,980 oz.

34. AURIFEROUS QUARTZ. Nugget lead, Golden Group Mining Co., Montagu, Hx. Co.—These very rich specimens are the property of the Mines Department and were obtained from Messrs. Jack & Bell. The Golden Group Mining Co.'s areas, though worked for many years at a good profit, are at present practically idle, although a little work has been lately done on the Iron lead.

35. AURIFEROUS QUARTZ. Montague, Hx. Co.—A collection of small rich specimens belonging to the Department of Mines. (C. W. Anderson samples.)

36. AURIFEROUS QUARTZ. Belt lead, Lawson mine, Montagu, Hx. Co.—These specimens are the property of the Mines Department.

37. AURIFEROUS QUARTZ. J. H. Townshend (now Shanghai) mine, Lawrencetown, Halifax Co.—Three systems of saddle veins have been more or less developed on three different anticlinal folds in this district, within a width of 2,500 ft. of gold measures. The belt worked contains about 10 tons of crushing material per 100 feet of wall surface, giving, it is reported, an average of about $20 per ton.

38. AURIFEROUS QUARTZ. W. C. Sarre's property, Cow Bay, Halifax Co.—All the veins in this comparatively new district cut the strata at right angles, their strike being approximately north and south. A few of them have been lately developed and found remunerative where they cross a band of schistose, felspathic quartzite, 100 feet wide, heavily charged with specks of pyrrhotite, and dipping north at an angle of 35 degrees.

39. AURIFEROUS QUARTZ. W. C. Sarre's Vermillion lead, Gold River, Lun. Co.—These rich specimens are the property of the Mines Department.

40. AURIFEROUS QUARTZ. MicMac Mining Co.'s mine, Millipsigate, Lun. Co.—This company took over the above property about 1901 from Messrs. Cashon & Hines, and has since been working continuously on a fissure vein of 13 in., which has proved to be very persistent in size and general characteristics. A cyanide plant has been added to the property, and the mine is in full operation.

41. SPECIMENS ILLUSTRATING CYANIDE PROCESS OF GOLD EXTRACTION. MicMac Mining Co., Millipsigate, Lun. Co.

42. AURIFEROUS QUARTZ. Millipsigate, Lun. Co.—From fissure vein having an average width of 18 in. (Mines Department.)

43. AURIFEROUS QUARTZ. Brookfield Mining Co.'s mine, North Brookfield, Queens Co.—This company worked this well-known property from 1892 till the end of 1905 when it closed the mine. The workings had reached a depth of about a thousand feet. The average size of the fissure vein worked is said to be about fourteen inches and it yields about $17.00 per ton. The gold was saved partly by amalgamation and partly by concentration and the cyanide process. A chlorination plant was also operated for a time before the adoption of the cyanide process. The whole Brookfield district has produced 38,441 oz. down to 1905.

44. SPECIMENS ILLUSTRATING CHLORINATION PROCESS OF GOLD EXTRACTION.—Brookfield Mining Co., North Brookfield, Queens Co.

45. SPECIMENS ILLUSTRATING CYANIDE PROCESS OF GOLD EXTRACTION.—Brookfield Mining Co., North Brookfield, Queens Co.

46. AURIFEROUS QUARTZ. Borden lead, Messrs. Archibald and Crease's Westlake mine, Mt. Uniacke, Hants Co.—This property is situated about twenty-five miles from Halifax and three miles from a railroad station and has been worked by the present operators since about 1901 until recently. A depth of between 200 and 300 feet has been reached. Some of the finest specimens ever taken from a Nova Scotian mine have been obtained from these workings.* The Uniacke gold district has up to the present produced 43,438 oz.

47. AURIFEROUS QUARTZ. Eastville & Withrow mines, South Uniacke, Hants Co.—These rich samples belong to the Mines Department. Only a few veins have been so far uncovered in this district. They follow the stratification on the north limb of a long, narrow anticlinal dome, dipping north nearly vertically and south nearly horizontally. A rich pay-shoot has been worked for a length of 2,000 ft., giving the high average yield of 10 oz. the ton.

48. AURIFEROUS QUARTZ. Renfrew, Hants Co.—A system of some 50 interlaminated veins has been developed here on the south side of a broad anticlinal dome. Several of them have been opened along their outcrops and many important pay streaks have been worked to depths reaching 350 feet. The district has produced 44,991 oz. Samples belong to Mines Department.

49. STIBNITE (Antimony Ore), AURIFEROUS. Dom. Antimony Co.'s mine, West Gore, Hants Co.—Stibnite was first discovered here in 1880 on J. McDougal's farm. The ore occurs in two main fissure veins, called respectively the North and South veins. The

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* A model of an unusually rich specimen from this mine is also shown.

former has received most attention up to now. It runs N 45° W and dips 85° to S W, and has been traced for over 1200 ft. In width it varies from a few inches to 7 ft., and in its widest part has been solid stibnite. The ore chute dips 45° to the S. E. More or less gold is found in the ore, and it seems to be the richest in that mineral when the percentage of stibnite is high. With the exception of where a cross vein of quartz comes into the vein at No. 1 shaft, none of the gold is free, even in ore assaying as high as 10 oz. gold to the ton. Assays of second-class ore have shown as high as $186 per ton of 2000 lbs. A very conservative estimate of the second-class ore left in the vein gives it an average thickness of 6 inches, containing 12 per cent antimony and $23 gold to a ton of 2240 lbs. Four shafts are on the north vein and the amount of ground stoped is roughly estimated at 76,000 square feet of the vein. From this amount of ground stoped 3121 tons had been shipped before the present owner secured the property, and from then till 1901 1236 tons were shipped. For a long time it was not known that the ore contained gold. Full particulars of this interesting ore will be found in the *Journal of Mining Society of Nova Scotia*, vol vi, p. 80; and also in the *Report of Dept of Mines of N S*, 1905, p. 69. A sample is also shown of concentrates from 5 per cent. antimony-gold ore.

50. ARSENOPYRITE, PYRRHOTITE AND CHALCOPYRITE (Gold, Arsenic and Copper ore). Richfield Mining Co.'s property, McLeod Brook, L'Abime River, Cheticamp district, Inver. Co.—This ore carries from $4 to $90 of gold per ton and the total value of the ore runs from $4 to nearly $97 per ton. Assays also show the presence of silver. The two principal deposits owned by the company are known as "Iron Cap" and "Mountain Top,"—the former consisting of a bed of chlorite schist 9 feet thick, carrying auriferous arsenical ore, the latter consisting of beds of serecite and chloride schists aggregating 50 feet in thickness, carrying similar ore. The age of these schists is Pre-Cambrian.

51. ARSENOPYRITE, AURIFEROUS QUARTZ, ETC. D. R. Campbell's Claim, The Ovens, Lun. Co.—This district formerly received a good deal of attention, and good returns have bren got from the sand on the shore, but it has been unworked for some time.

ANTIMONY

Stibnite, or sulphide of antimony, occurs at West Gore in Hants county, carrying considerable per centages of gold and silver. A mine is opened on this deposit, and about 3000 tons shipped. Other deposits are known in the vicinity also carrying high gold values and it is probable that before long attempts will be made to work them as well.

52. **Stibnite** (Antimony ore), **Auriferous.** Dom. Antimony Co.'s mine, West Gore, Hants Co.—An account of this interesting ore will be found under the heading Gold in this catalogue, p. 20.

GRAPHITE.

This mineral, chiefly as graphitic shale, occurs in Cape Breton Island at Grand Narrows, Glendale, West Bay, East Bay and Hunter's Mountain, in the slates of the Nova Scotia gold-fields, as at Musquodoboit, Hammond's Plains, etc.

These deposits appear in some cases to be well suited for the arts, but no attempt has been made to mine them.

53. **Graphite.** Morrison's farm, French Vale, C. B. Co.—Owned by John A. McKenzie and others of Sydney. So far this deposit has only been prospected. Surface material on analysis gave 39 p. c. graphite. See analysis in Report Geol. Survey of Canada.

54. **Graphite.** H. F. McDougall's property, near Christmas Island, C. B. Co.—Awarded a diploma at the Paris and Glasgow exhibitions of 1901. The analysis is as follows:—

Graphitic carbon	50.23
Rock matter	43.37
Water	6.50

COPPER ORES.

Ores of this metal are found in many places in Nova Scotia. At present, extensive developments are being made at Cape d'Or, Cumberland County, in trap rock carrying native copper. The district lying between Springhill and Pictou holds many outcrops of chalcocite, some of which have been tested to some extent.

Polson's or Copper Lake and Lochaber in Antigonish County, contain promising deposits. Coxheath near Sydney has deposits of copper-pyrites which have been developed to make the basis of a large mining and smelting business.

In the Cheticamp district the Cheticamp Copper Company, Mr. Brookfield and others are opening up deposits which promise the best of results, and promising indications are met over a great part of northern Inverness and Victoria.

NATIVE COPPER.

55. **Native Copper.** Colonial Copper Co.'s mine, Cape d'Or, Cumb. Co. This company is developing a copper property at Cape d'Or

containing 2,300 acres. It also owns and has prospected copper areas elsewhere, but its principal operations are now confined to Cape d'Or, where modern hoisting gear has been erected with a present capacity of 500 tons a day, and a new double-tracked inclined shaft sunk, to serve the former developments, consisting of about 5,000 feet of drifts, stopes and winzes. The 100-ton roller crushers at the concentrator are now being operated and additional machinery installed for doubling the capacity. A railroad is employed in transporting ore from the mine to the mill. The native copper at Cape d'Or occurs in veins and joints in the Triassic trap.

CHALCOCITE.

56. COPPER MATTE, 60 p. c. copper. Late Copper Crown Mining Co.'s smelter, Pictou, Pict. Co.—This matter was produced several years ago from Nova Scotian ores during the time this smelter was in operation. It was probably largely produced from chalcocite ores.

57. CHALCOCITE AND MALACHITE in sandstone. Amos Blenkhorn "mine," Acadia Copper Co., between Nappan and Maccan, Cumb. Co. Copper was found here about 1890, and about 1898 a good deal of prospecting was done and a timbered slope was sunk about 80 feet (dipping southward about 47°), and a few tons of picked ore shipped to the Copper Crown smelter at Pictou. Associated with it are argentiferous galenite, azurite, sulphides of iron and copper, and lignite. Gold is said to have been present in some of the assays. The property is now unworked.

58. CHALCOCITE AND MALACHITE with "Lignite" in sandstone. W. A. McPherson's property, John Chisholm's Brook, Pugwash River, Upper Pugwash, Cumb. Co.—Copper was discovered here by J. Chisholm in 1883. The property has been prospected by Mr. Chisholm and Mr. McPherson. Four trial pits and a tunnel are on the property. The copper-impregnated sandstone beds are supposed to have a thickness of 12 feet, and they are said to have been proved on the strike for over a hundred feet. Four or five tons of chalcocite have been shipped to Boston and some tons are now on the site. The sandstones are of Permian age.

59. CHALCOCITE AND MALACHITE in sandstone. W. A. McPherson's "copper claim," Canfield Creek, near Upper Pugwash, Cumb. Co. This deposit in Permian sandstone has been prospected by Mr. McPherson, who in 1902 sank a shaft 25 feet and took out a quantity of ore.

60. CHALCOCITE AND MALACHITE in sandstone. Late Wentworth Copper Co.'s property, Malagash Point, Cumb. Co. This deposit resembles the other copper deposits in the Permian rocks of the province.

61. **CHALCOCITE** in sandstone. Late Cumberland Copper Co.'s mine, Wallace River, near Wentworth, Cumb. Co.

62. **CHALCOCITE NODULES.** Colonial Copper Co.'s mine, French River, Oliver, 4 m. south of Tatamagouche, Col. Co.—Sixty-five years ago or more, copper was first found here; and some years after, the first license to search was taken out by Abram Patterson, father of late Dr. Geo. Patterson. Patterson drove tunnels and sank shafts and extracted some of the nodules which yielded 74 p. c. copper. Afterwards the property was worked by Mr. Pendergrast, and also by Fleming Brown, the latter being the first to work the lignitic ore referred to elsewhere. Brown's company sold to the Colonial Copper Co., the present owners. The property has been well prospected, and a number of tunnels, shafts and bore-holes have been driven and put down. It has long interested capitalists, but is at present idle. The nodules such as shown are particularly rich. Information regarding these deposits may be found in How's *Mineralogy of N. S.*, p 69, and in the writings of Dr. Gilpin and many others.

63. **CHALCOCITE** with "Lignite." Colonial Copper Co.'s mine, French River, Oliver, Col Co.—Information regarding this property will be found in the preceding note on nodules from that locality. The zone of lignitic ore is to the north of the nodule beds.

64. **CHALCOCITE** with "Lignite" in sandstone. Late Copper Crown Co's mine, French River, New Annan, Col. Co.—This property which is a little higher up the French River than that of the Colonial Copper Co., was worked several years ago by the company named. The formation is Permian and resembles other deposits of the district.

CHALCOPYRITE.

65. **CHALCOPYRITE, ETC.,** carrying also Gold and Silver. Cheticamp Copper (late Eastern National Copper) Co.'s property, L'Abime River, Cheticamp district, Inv. Co.—The deposit which is claimed to be very extensive, is at present attracting a good deal of attention and is being prospected and developed by the above named company. The ore, which is chiefly chalcopyrite, occurs in hydromica chlorite schist of Pre-Cambrian age. There appears to be a series of ore-bearing beds or zones at different horizons, the highest being at an elevation of 1,300 ft. above sea level. As the result of prospecting the company claims it has proved the existence of one deposit at least 1050 feet on the outcrop and 100 feet on the dip. Samples taken across the entire width of the deposit have run from 2.4 per cent to 5 per cent. in the copper, whilst samples from lenses have run from 5 per cent to 8 per cent copper. The ore also carried as high as $8.50 per ton in gold and silver. The lowest estimate of the copper contents of the rock has been placed at 2½ per cent. There is on the property a water-power

estimated to run 1,700 horse-power. Further particulars will be found in a paper by M. V. Grandin on the "Ore Deposits of South Cheticamp" in the *Trans. N. S. Inst. Sc.*, vol. 10, pt. 3. The tabulated statement below will give an approximate idea of the assay value per ton of the ore-body, figuring metallic copper at 12 cents per pound :—

Sample.	Gold.	Silver.	Copper.
From weathered outcrop.... ...	$1.32	$1.03	2.40 p. c.
From quartz gash-veins........	6 60	4.40	7.81 p. c.
Quartered down samples from across the deposit..........	Not assayed for		3.00 p. c. 4.00 p. c. 5.00 p. c

One test gave the following values :—

Gold..........................	13 dwts. per ton.
Silver	7 83 ozs. per ton.
Copper........................	7.84 per cent.
Value..........................	$34.42 per ton

66. CHALCOPYRITE. "B" vein, No 2 shaft, Boston Holding Co.'s mine, Beechmont Coxheath Hills, C. B Co.—This well known deposit has been amply developed and is one of the more promising ones in the province. The company was formerly known as the Eastern Development Co.,and, until a couple of years ago, as the Cape Breton Copper Co. The mining areas cover 2 sq. miles and the land and water lots owned in fee, 1484 acres Four shafts are on the property, respectively 300, 420, 100 and 45 feet deep ; and the areas have been also well prospected by trial pits and trenches. The first shaft was sunk in 1880 and the last one in 1892. No. 2 (420 ft.) shaft is the main one, from which is won the ore of veins "B" and "C." The plant is excellent and includes steam hoists, compressors, 12 Rand slugger drills large ore table, trams, saw-mill, etc., etc. A large amount of ore is on the surface, and on being sampled straight across gave an average of 7 p. c., copper for the whole pile. The mine has been closed since about 1900.

67. CHALCOPYRITE. Alex. Matheson property (C. P. Moffatt), George's River Mountain C. B Co —Awarded 1st class diploma at Paris and Glasgow Exhibition of 1901.

68. CHALCOPYRITE in Quartz. Boston Holding Co's (late Cape Breton Copper Co's) mine, Eagle Head Gabarus Bay C. B Co.—This deposit which occurs in Pre-Cambrian rocks has been known for some years and a fair amount of development work has been done upon it at various times It belongs to the company which owns the Coxheath mine in the same county

69. CHALCOPYRITE in Quartz A McKay's mine. New Larig near Lansdowne, Pict. Co.—This deposit was developed several years

ago by the Copper Crown Mining Co., which sank shafts and opened up the property with the intention of drawing therefrom ore for its smelter at Pictou. Since this company became defunct a few years ago, the mine has been idle. Lansdowne Station, on the Intercolonial Railway, is only a few miles from the property, which thus has good facilities for transportation.

70. CHALCOPYRITE in Quartz. Hiram W. Yuill's areas (lease No. 89), Six Mile Brook, Pictou Co.—Sample from H. W. Yuill of Truro.

71. CHALCOPYRITE in Quartz. Six-mile Brook, Pictou Co.—Sample furnished by William Creelman of Truro.

72. CHALCOPYRITE in Siderite. Polson's Lake mine, Copper Lake, Antig. Co.—The ore at this well-known and promising property consists of chalcopyrite with some pyrite in a vein of coarsely crystalline siderite at or near the contact of Devonian slates with intrusions of diorite, etc. The vein varies in width from 1 to 6 ft., or less, and has been traced for a considerable distance. Large samples of the ore have yielded from 5.67 to 11.70 per cent. of copper, although an average yield would, of course, be lower. The siderite contains 73.68 per cent. of carbonate of iron (equivalent to 35.57 per cent. metallic iron). The mine, which is situated on a hill on the east margin of the lake, has a shaft-house and steam hoist and pump. The shaft is timbered, and the levels have opened up a considerable amount of ore. The mine has been closed for several years, the long haul of some 15 miles to a shipping point being at present an obstacle to profitable mining. The tempting character of these deposits, however, and the high price of copper, will doubtless prevent it from long remaining idle, particularly if greater facilities for transport should offer. The occurrence of copper here has long been known. The finding of rich boulders led to intermittent prospecting for some forty years, and finally resulted in 1875 in the discovery of the ore-bearing vein which was traced for several hundred feet. In 1876 the vein was opened by a 25 ft. shaft, and in 1879 two shafts were sunk about 60 ft., but work was then suspended. At a distance of 150 ft. along this vein another opening was made and the width found to be 11 ft and the copper contents had also increased. I understand the mine was again worked for a time about 1900, when the Copper Crown Co.'s smelter at Pictou was in operation.

Present owner, principal owner, is Dr. H. H. MacKay, New Glasgow, Nova Scotia

73. CHALCOPYRITE with Specular Hematite and Quartz. College Grant mine, College Grant, about 2 m. west of foot of Lochaber Lake, Antig. Co. The finding of a cupriferous boulder on the college lands a number of years ago led to the discovery of its source, and in 1876 a shaft about 55 ft. deep was sunk in greenish epidotic serpentinous diorite cutting Devonian slates and traversed by veins of quartz, in which as well as in parts of the diorite were large blotches of beautiful micaceous hematite and chalcopyrite.

Since then considerable development and prospecting of the property has taken place at various times. The deposit consists of some six veins. The first one is 2 ft. wide; the second, 20 ft distant, is from 5 to 6 ft. wide and holds 20 per cent. of chalcopyrite evenly distributed with micaceous iron, etc.; the third, 216 ft. distant, is from 1½ to 2 ft. wide and carries chalcopyrite; the fourth, 130 ft. distant, is about 5 ft. wide and carries about 10 per cent. ore, with much quartz, the fifth and sixth, 50 and 150 ft. further east, are each 3 ft wide. An assay of 7 cwt. sent from this mine to Swansea gave 19.87 per cent copper. Like the neighboring Polson's Lake, mine, these deposits at present suffer from lack of transport facilities.

74 CHALCOPYRITE with Quartz. John McNaughton's farm, Appin Lochaber, Antig. Co.—This deposit which occurs on the hills overlooking the lake, has so far only been prospected by a few pits within the last two or three years. The ore occurs in quartz veins in Silurian slate near its contact with intrusive rock.

BORNITE.

75 BORNITE with MALACHITE. McDonald's areas Upper South River, Antig. Co.

LEAD ORES.

In Nova Scotia these ores are found principally in the carboniferous limestone and in the Pre-Cambrian formations. As yet few attempts have been made to prospect them. The limestones carry lead ore, more or less silver-bearing, in the counties of Pictou, Colchester, Halifax, Guysboro, and at Cheticamp and other places in Cape Breton Island.

At Smithfield, in Colchester, the presence of large amounts of galena was proved some years ago, but the low silver contents and the price of lead were discouraging. It is, however, evident that this deposit and others in the country are well worth further consideration.

76 GALENITE ARGENTIFEROUS. Cheticamp Gold Mining Co.'s property, L'Abime Brook, Cheticamp district, Inver. Co.—This deposit of galena was discovered in 1896 while prospecting for gold. The face of the opening is stated to show 20 per cent. galena and 3 per cent. copper. The ore is reported to carry on an average 1 oz. of silver for every unit of lead, with gold in places up to 14 dwt. per ton.

77. GALENITE ARGENTIFEROUS and CHALCOPYRITE. Inverness Mining Co.'s property, "Silver Cliff," L'Abime River, Cheticamp district, Inver. Co. This property is immediately south of the Eastern Copper Co.'s property. It has so far only been prospected.

78. **Galenite, Argentiferous.** Property of Geo. E. Franklyn and others, Smithfield, near Upper Stewiacke, Col. Co.—At this locality a considerable amount of exploratory work has been done. The ore is found in carboniferous limestone, apparently replacing it in part, and as a residual concentration from the removal of the rock. At one place a considerable amount of the ore is shown, and the deposit, as elsewhere stated, seems to deserve further attention. The average percentage of lead, from a number of analyses, is 57; and the silver contents 25½ ozs. per ton. For particulars respecting this ore, see *Rept. Geol. Survey of Canada*, 1892-3, p. 84 S.

IRON ORES.

Ores of iron are known in workable amounts in nearly every county of Nova Scotia. Every variety and quality of ore is met: magnetite, red hematite, limonite, etc. At present mining operations are confined chiefly to the property of the Londonderry Iron and Mining company Colchester County, and to the Torbrook district, Annapolis County.

The deposits in the districts of Torbrook and Nictaux, Londonderry and Bridgeville are very large and in many cases of excellent quality. Deposits are also known at Clementsport, Clifton, Goshen, Newton Mills, Selma, Brookfield, Arisaig, Pugwash, Salmon River, Mira, East Bay, George's River, Barachois (Boisdale), Whycocomagh, etc., etc.

At present the steel and iron works at Sydney and Sydney Mines are supplied with exceptionally cheap ore from Bell Island, Newfoundland, but as the cost of this ore increases, the local deposits will be called on.

PRODUCTS.

79. **Raw Material and Products.** Dominion Iron and Steel Co., Sydney, C. B. Coal, coke, Wabana hematite (iron ore), Marble Mountain limestone (flux), George River dolomite (flux), sand, pig iron (Nos. 1, 2 and 3) machine cast pig-iron, steel ingot, steel billets, steel slabs, 80 lb. rails, iron rods, sulphate of ammonia, etc.—The very extensive works of this company are too well known to require anything but a very brief description. The company was incorporated in 1899 and soon after began construction work at Sydney on a site of large size. The works now include, in general, a plant of 4 blast furnaces (85 feet high and 20 feet diameter at the boshes), 10 50-ton open hearth furnaces (estimated output 1,400 tons per day), 35 inch blooming mill and pit furnaces; rail mill etc. in operation 14th June 1904 capacity estimated at 500 tons in each shift, 400 Otto-Hoffman coke ovens (capacity 1,600 tons per day), coal washing and sulphuric acid plants, and essential

by-product plants; machine-shop and foundry. Ore is chiefly obtained from the company's Wabana mine (Bell Island), Nfld.; limestone from Marble Mountain, Inv. Co.; dolomite from George's River and New Campbellton; and coal from the Dom. Coal Co.'s mines in the Sydney coal-field. The output for the year 1903 was, coke, 310,641 tons; pig iron, 155,139 tons; steel billets and slabs, 117,986 tons.

80. Raw Material and Products. Nova Scotia Steel & Coal Co., Trenton (New Glasgow), Pictou Co. and Sydney Mines, C. B. Co. The excellent exhibit* shown by this company includes: red hematite from the Wabana mine, Newfoundland; coal and coke from Sydney Mines, C. B.; limestone (flux) from Pt. Edward quarry near Sydney, C. B.; dolomite (flux) from George's River, C. B.; foundry pig iron; machine pig (for steel); open hearth basic steel ingot (weight 3300 lbs., analysis—phosphorus .0258, carbon .21 manganese .62, and sulphur .038); steel billets; a crankshaft of excellent workmanship; car axle; shafting, rails, angle-iron, bar-iron, fish-plates, tie-plates, sleigh-shoe steel, spikes (some exhibiting the effects of severe tests), etc.

This company has had an interesting history. It has developed from the Nova Scotia Forge Co., which was established at New Glasgow in 1872. About 1882 a branch of it began as the N. S. Steel Co., to manufacture steel from imported pig-iron. In 1892 the New Glasgow Iron, Coal and Ry. Co. built a blast furnace at Ferrona near New Glasgow for smelting the East River iron ores near by, and it also erected the first coal-washing plant in Canada in that year. This furnace, etc., was acquired in 1895 by the N. S. Steel Co., which continued the smelting of the East River ores until they were replaced by red hematite from the company's Wabana mine, Newfoundland. A year or two ago the Ferrona works were closed, a new and improved furnace of 180 tons capacity, with 150 Bernard coke ovens, open-hearth steel plant of 3 furnaces each with a capacity of 40 tons, etc., having been erected at Sydney mines, C. B., alongside the company's coal supply. The open-hearth plant was put into operation in July, 1905. An extensive limestone quarry, to furnish flux, has also been recently opened up at Pt. Edward near Sydney. The steel works at Trenton, consisting of 4 Siemens furnaces, etc., are still in full operation. In 1905 28,723 tons of pig iron were sold and 28,225 tons of finished material shipped from the steel department.

81. Pipe Castings, from Londonderry and Torbrook iron. Montreal Pipe Foundry Co.'s works, Londonderry, Col. Co.—This company was established a few years ago and has extensive works close to the Londonderry Iron and Mining Co.'s furnace. It obtains its iron from the latter company, which smelts ores obtained from its Londonderry and Torbrook mines.

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*The coal exhibit of this company is described under coal, No. 5.

PYRITE.

82. PYRITE (Iron Pyrites). W. M Dustan's property, Pleasant Bay, Inv. Co.—An analysis made in the laboratory of the Dom. Iron & Steel Co., showed sulphur 41.40 per cent., iron 33.15, arsenic trace. The deposit, which is three miles from shore, could be utilized as a source of sulphuric acid. Owned by W. M. Dustan of Pictou.

83. PYRITE (Iron Pyrites). Rev. M. A. McPherson's property, George's River Mountain. C. B. Co.—This deposit is reported to be extensive—the mineral being distributed in an area from 20 to 30 ft. wide and extending for a considerable distance. Doubtless could be worked as a source of sulphuric acid.

PYRRHOTITE.

84. PYRRHOTITE (Magnetic Iron Pyrites) Rev. M. A. McPherson's property, George's River mountain, C. B. Co.—This deposit is reported to be large, and is said to carry nickel.

HEMATITE.

85. HEMATITE, RED. Rev. M. A. McPherson's areas, Barachois, Boisdale St. Andrew's Channel, C. B. Co.—This deposit has been prospected and the occurrence of iron traced for a considerable distance. Average analyses are said to give 65 p. c. metallic iron, and have gone as high as 69 p. c.

86. HEMATITE, SPECULAR. Lease of John Greener and Sheriff Geo. B. Ingraham, Boisdale, C. B. Co.—This ore occurs not far from the railway and St. Andrew's Channel. An analysis of it is as follows:—

Peroxide of iron	96.14
Oxides of aluminum and manganese	.60
Lime	.11
Magnesia	.10
Sulphur	01
Phosphoric acid	.04
Insoluble silicious matter	2 12
Metallic iron	67.30

87. HEMATITE RED. T. Routledge near Marion Bridge, C. B. Co. Excellent ore occurs in this district and has been prospected to some extent.

88. HEMATITE RED. Grand Anse, Rich Co.—This deposit was prospected to some extent in 1903, Wm. McFatridge, of Halifax, and others being interested in it.

89. **HEMATITE, SPECULAR.** Londonderry Iron and Mining Co.'s Cook's Brook mine Londonderry, Col. Co.—This ore carries 67 per cent. metallic iron. A short description of this company's well-known property will be found under Nos. 106-108 in this catalogue.

90. **HEMATITE, SPECULAR.** No 1 shaft at Monroe's, property of J. J. Snook, A. H. Learment, and estate of Dr. J. H. McKay, Upper Kemptown, Col. Co.—This is from a promising property which has been prospected during the last few years by the owners. Trial pits have proved the existence of ore from hence about three miles westward, the deposits resembling somewhat those of Londonderry. This ore is mostly limonite, but specular hematite is cut at some places. At Monroe's which is toward the eastern extension of the beds a shaft or pit has been sunk on the ore which occurs in a zone of considerable thickness. It consists mainly of limonite, with about a foot of specular hematite (such as shown) on the foot-wall. A number of tons of ore have been extracted here. Near by is the McKay shaft or pit, showing specular hematite. Continuing westward on the strike of the bed, limonite has been found in trial pits at McDonald's (No. 2 pit), at No. 3 pit, and at Lansburg's (No. 4 pit). About the latter some boulders of excellent limonite occur as float. The ore occurs in rocks of Devonian age.

The following are analyses of ore from this locality:—

	Dom. I. & S. Co.	Mason
Iron	64.89	64.25
Phosphorus	.064	.08
Sulphur	trace	nil
Silica	4.39	4.66

91. **HEMATITE, SPECULAR.** McKay pit, (near No. 1, sha property of J. J. Snook, A. H. Learment, and estate of Dr. J. H. McKay, Upper Kemptown Col. Co.—Some general information about the iron deposits here will be found in the preceding item.

92. **HEMATITE, RED.** East Branch Doctor's Brook near Dunn Point, Antig. Co.—This promising and extensive property containing 10 sq. miles, is at present controlled by C. N. Wilkie, D. G. Whidden, and Alex. Stephen. Much prospecting has been done here by Laughlin McDonald, a New Glasgow company and Joseph Pushie. It is claimed that there are thirteen beds of hematite opened up on ten square miles running in thickness from 3 to 20 feet, or a combined thickness of 80 or 90 feet of ore. The zone of ore beds extends for a number of miles, trial pits and shafts having proved it in very many places. Some of the smaller beds contain the better ore, which has assayed from 40 to 59 per cent metallic iron. A good future is expected for this property should more attention be given to our local ore. The ore is apparently in large quantity but somewhat silicious in some of the beds. The sample shown is from a bed about 20 ft thick with some stone partings.

93. Hematite, Red. C. N. Wilkie's areas, Arisaig, Antig. Co.—This is from the western part of Mr. Wilkie's areas, some particulars of which have just been given.

94. Hematite, Specular, with Chalcopyrite. College Grant Copper mine, College Grant, near Lochaber Lake, Antigonish Co.—Beautiful specimens of micaceous hematite are found here, associated with dykes cutting Devonian strata. See copper ore No. 73.

95. Hematite, Red. Leckie vein, Londonderry Iron & Mining Co.'s (late Torbrook Iron Co.'s) mine, Torbrook Mines, Ann. Co.—This deposit is well known, and much work has been done upon it and a large quantity of ore raised. In 1890 R. G. Leckie investigated the district, and in the next year the Torbrook Iron Company began active mining operations and constructed a branch railway to the main line. In 1894 the daily output was about 130 tons, and four shafts had been sunk. After having been closed for seven years the mine was unwatered in April, 1903, by the Torbrook Iron Co., and ore raised after June, the output being about 75 tons per day. The main slope is about 300 feet deep, and there are five levels. The bed of ore varies in thickness from 6 to 12 feet (average about 8 feet). A cross cut at 20 feet south struck an 8 feet bed of hematite, overlying the one worked. The ore was shipped to the Londonderry Iron Co. to be smelted. The shipping ore averaged about 55 per cent. iron. Sulphur is reported to be absent, and phosphorus not higher than 1 per cent. The mine became the property of the Londonderry Iron and Mining Co., which, after operating it for some time, recently closed it, and that company is now developing the neighboring Corbett mine, on the "shell-ore vein."

96. Hematite, Red, (fossiliferous). Shell-ore vein, Corbett mine, Fletcher Wheelock's farm, Torbrook, Ann. Co.—The presence of iron ore at this place in rocks of supposed Devonian age has long been known. A quantity of ore was taken from a trench along the outcrop and smelted at Nictaux Falls by a London company some fifty or sixty years ago. After being operated for ten or fifteen years the mine and smelter were abandoned. The depth and extent of this bed was recently proved by bore-holes, and about February 1903 Messrs. Geo. E. Corbett, S. M. Brookfield and others began sinking a shaft which is said to have started in 6 feet of good ore, strike N. 65 E. (magnetic), and which at about 40 feet had widened out to 7 feet. The mine is at present being extensively developed by the Londonderry Iron & Mining Co., which expects to draw therefrom a supply of ore to take the place of that lately obtained from their Leckie or Torbrook mine, which is now closed. The mine is about 2½ miles from the Torbrook mine.

97. Hematite, Red. Bluff on shore, G. W. Dill's farm, (lease of K. and G. J. Mackintosh), Cambridge, Hants Co.—Analysis gives

59.95 per cent. metallic iron. The bed as exposed in the face of the cliff is reported to be 6 feet thick. So far the deposit has only been prospected.

MAGNETITE.

98. MAGNETITE. Hon. R. Drummond's mine, Iron Mines, Skye Mountain, near Whycocomagh, Inv. Co.—This deposit, which is on the Indian Reserve, has been worked by Mr. Drummond and others. Two tunnels have been driven into the side of the mountain, and a good deal of prospecting done, revealng the presence of ore in various parts of the property. The ore passes into hematite occasionally. At one spot about 200 tons of magnetic ore have been taken out. It is believed that there is a large amount of ore on the area but sufficient prospecting has not been done to determine the quantity. Many analyses have been made, all favorable.

99. MAGNETITE. R. P. Fraser's area, Iron Mines, Skye Mountain, near Whycocomagh, Inv. Co.—The sample shown is from a trial pit on the side of the mountain and about a mile from the road. Other prospecting has been carried on in this area. Analyses of Skye Mountain magnetite made in the laboratory of the N. S. Steel Co. gave iron contents 49 to 63 per cent., and phosphorus .01 to .5 per cent.

100. MAGNETITE. Lease of Jacob S. Hart and others, Mulloch, near Whycocomagh, Inv. Co.—A good deal of prospecting has been done here and some ore extracted and piled at the shaft, and during 1906 some men were engaged in further exploratory work.

101. MAGNETITE. Rev. M. A. McPherson's areas, Barachois Mountain, St. Andrew's Channel, C. B. Co.—A shaft has been sunk 33 ft. on this property and the deposit has been traced by trial pits for a considerable distance. The ore is reported to average about 60 p. c. metallic iron.

102. MAGNETITE. Property of A. G. Hamilton and others, Mira, C. B. Co. Some hematite also occurs on the property.

103. MAGNETITE. Moose River mine, near Clementsport, Ann. Co.—This was one of the first iron deposits to receive attention in Nova Scotia. The Potter mine was first opened about 1824. About 1825 a company was formed under the auspices of C. T. Jackson and F. Alger, to work this ore, and a smelting furnace was operated for a time. In 1857 or 1858 the works were re-opened by a Bangor, Me., company and operated until about 1862 when its output was five tons a day. About 1872 the furnace was again in blast. The ore-bed is several feet thick and is fossiliferous in parts. It occurs in strata which are probably of Devonian age.

104. MAGNETITE. About 2½ miles north of Somerset post office, Kings Co.—This ore occurs in Triassic trap rock associated with

amethyst, but so far such deposits have not been found to be of large extent. The specimens were taken from an area covered by N. W. Keddy and Dr. March's lease, on Arthur Palmer's land. The vein or lens is from 7 to 10 inches thick, and the iron contents of the ore is said to be 61 per cent. The lack of continuity, or the pockety character of the deposit is an obstacle to the extraction of the ore for commercial purposes.

LIMONITE.

105. LIMONITE. Canfield Creek, Upper Pugwash, Cumb. Co.—This deposit is said to have been opened up by the Londonderry Iron Co about 1887 and some tons of ore shipped to Londonderry. It was subsequently prospected by the Dominion Steel Co. The present specimen is possibly a poor sample of the ore. Ore also occurs across the creek, doubtless on the strike of this bed.

LIMONITE. Londonderry Iron & Mining Co.'s mines, Londonderry, Col. Co.—

106. Limonite, 50 p. c. metallic iron. Cumberland mine.

107. Limonite, 50 p. c. metallic iron. Old Mountain mine.

108. Limonite, "bottle ore," 48 p. c. metallic iron. Cumberland mine.

[The company's specular hematite, 67 p. c. met iron, from Cook's Brook mine (No. 89); ankerite with specular hematite, 30 p. c. met. iron, from East mine (No. 122); and ankerite, 12 p. c. met. iron, from Old Mountain mine (No. 121); will be found catalogued under the numbers just given.]

These well-known iron deposits, formerly known as the Acadia Iron Mines, occur in slate and quartzite on the southern slope of the Cobequid Hills. The ore bed has an approximate east and west course, dips south at an angle of 75° to 80°, and has been traced for some twelve miles. Its width is sometimes a couple of hundred feet, and it is composed of ankerite with limonite and specular hematite of low phosphorus and sulphur character. In some parts the ankerite has decomposed to ochre. Advantage is taken of the large deposits of ankerite to use it as a flux for which purpose it is well adapted because of the carbonate of lime in its composition. Particulars of the various Londonderry ores will be found in a number of papers and books dealing with the economic geology of the province. The deposits have been worked in places on a large scale for many years chiefly by tunnels driven in from the various intersecting brook valleys and also by open workings on the outcrops on the mountains. Mining has been carried on intermittently since 1849, the first iron being made by the Catalan forge in 1850. A charcoal furnace was erected in [illegible] which was in blast at intervals for some years, the works being known as the Acadia Charcoal Iron Works. In 1876 a change was made from charcoal to coke as fuel, and two furnaces were built. The Steel Company of Canada operated here for a time, having besides the furnaces and coke ovens a rolling mill and foundry. About 1887 the Londonderry Iron Company acquired this company's property and operated for some years. After being unworked for some time, the Londonderry Iron & Mining Company obtained possession of it about 1902, and are now actively engaged in mining and smelting. The furnace now in blast is 75 ft. high and 17 ft. in the bosh, and has a capacity of somewhat less than 150 tons of foundry iron a day. The Montreal Pipe Foundry Company at Londonderry is supplied with pig from this furnace. The Londonderry Company also controls the Torbrook mine, Annapolis County, from which, until recently, it has been drawing a large supply of red hematite. This mine, however, is now closed and the company is developing the neighboring Corbett mine (hematite) on the Fletcher Wheelock farm.

The following analyses of limonite are from the Report of the Geol. Survey of Canada, 1873-4.

	OCHREY LIMONITE		COMPACT LIMONITE
	Cumberland Brook		Ross Farm
Peroxide of iron........	79.68	.. ...	84.73
Protoxide of iron	— —	....	trace
Protoxide of maganese........	2.51	....	0.23
Alumina....	0.63	....	0.23
Lime	0.57	....	0.14
Magnesia	0.34	. ...	0.14
Silica	3.05	....	—
Phosphoric acid..............	0.44	....	0.19
Sulphuric acid..............	0.01	....	0.01
Water (hygroscopic)..........	0.78	....	0.33
Water (combined)....	11.65	.. ....	11.07

Equivalent to

Metallic iron................	55.78	.. ....	58.31
Phosphorus	0.19	....	0.083

109. LIMONITE. No. 2 pit (at McDonalds) property of J. J. Snook, A. H. Learment and estate of Dr. J. H. McKay, Upper Kemptown, Col. Co.—Some particulars regarding this property will be found in the paragraph relating to hematite from No. 1 shaft at Monroe's. The existence of ore in this district has been known for about twenty years. Limonite from Upper Kemptown has been analyzed with the following partial results

	No. 1 Shaft.	
Metallic iron	50.43	52.12
Silica	13.56	11.62

110. **LIMONITE.** No. 4 pit (at Lensburg's), property of J. J. Snook, A. H. Learment, and estate of Dr. J. H. McKay, Upper Kemptown, Col. Co—This is from the western extension of the iron property of these gentlemen, which has been described when treating of hematite from the No. 1 shaft at Monroe's.

111. LIMONITE. Alex. Nelson farm, Upper Brookfield, Colchester Co.—This deposit which is about 2½ miles from Brookfield station has been known for a long period, and has been worked intermittently by the Londonderry Iron Co. and others, the ore being of excellent quality. The following is Dr. How's analysis of ore from this mine:

Water	11.36
Silica & gangue	1.54
Sulphuric acid	trace
Phosphoric acid	trace
Magnesia	trace
Peroxide of iron with very little alumina	87.10
Metallic iron	60.00

112. LIMONITE, ETC. Old Barns, Col Co.—This deposit is on the farms of Isaac Youill and John and Robert Forbes, and is, or was lately, owned by H V. Harris, Thos. G. McMullan and others. A timbered shaft about 100 feet deep, with levels, has been sunk, and there is also an old abandoned shaft. Some of the ore is altered to hematite and also probably is associated with Göthite.

113. LIMONITE. Saddler mine (Fraser farm), near Bridgeville, Pictou Co.—Owned by Alex. Fraser and others. Now unworked. About 1850 ore was mined here by the General Mining Association, and about 1886 some was shipped to the Londonderry furnaces. The N. S. Steel Co. has also worked the mine on royalty. The shaft is 150 ft. deep. The samples shown do not well represent the quality of the ore, no good specimens being obtainable. One specimen is manganiferous.

114. LIMONITE. Mine on Grant farm, near Bridgeville, Pictou Co. William Grant first found ore here some forty years ago. Worked by Pictou Charcoal Iron Company and others. The mine was in operation in 1903 having been opened in that year by the Bridgeville Mining Co., and a considerable quantity of or [illegible] aid to have been taken out and sold to the Nova Scotia Steel Company at $3.00 per ton averaging 40 p. c. iron. The main shaft, 20[illegible] feet deep

with two levels, was closed, and a new shaft was sunk to the north. No work is now being done on the property.

115. Limonite. McDonald mine, Bridgeville, Pict. Co.—A good deal of work has been done in this mine in the past, but it is now unworked.

116. Limonite. Cameron mine (Tanner mine), south side road, J. S. Cameron's farm, Bridgeville, Pict. Co.—Shaft 600 ft. deep, sunk by the N. S. Steel Co. about 1895. Now idle. Another shaft is on the north side of the road.

117. Limonite. Fraser mine, (Samuel Fraser's), Bridgeville, Pictou Co.—This mine, like others in the district, was worked by the Nova Scotia Steel Co. and others, but is now idle.

118. Limonite, var. Bog Iron. Long Swamp, Preston Road, near Dartmouth, Halifax Co.—This deposit was discovered a few years ago, and was prospected to some extent, the excellent quality of the ore being an inducement. It would seem, from what little work was done, that the deposit is a few feet thick, and it has not, so far, been proved to be of great extent. One analysis gives the iron contents of this ore as 54.8 per cent.

119. Limonite, var. Bog Iron. West Indian Road, Hants Co.—The sample was furnished by R. M. Holesworth, Shubenacadie, who is interested in the property. It is said to analyze 56 p. c. iron.

OCHRE.

120. Limonite, var. Yellow Ochre. Lambert Lynn's property, Chimney Corner, Inv. Co.—This ochre, which is reported to be in quantity, furnishes, when burnt, a very beautiful color.

ANKERITE.

121. Ankerite. Londonderry Iron & Mining Co.'s Old Mountain mine, Londonderry, Col. Co.—This contains 12 per cent. metallic iron, and the large amount of carbonate of lime makes it useful as a flux in smelting. Information regarding these mines will be found under Nos. 106-108. The following proximate analysis will indicate the composition of this mineral:—

Carbonate of iron	23.45
Carbonate of lime	43.80
Carbonate of magnesia	30.80
Carbonate of manganese	80
Silica	10

122. ANKERITE WITH SPECULAR HEMATITE. Londonderry Iron & Mining Co.'s East mines, Londonderry, Col. Co.—This ore carries 30 per cent. metallic iron, and is known as the East mines spathic ore. The amount of carbonate of lime it contains makes it useful as a flux in the furnace. Information regarding this company's property will be found under Nos. 106-108 in the catalogue.

SIDERITE.

123. SIDERITE with Chalcopyrite. Polson's Lake copper mine, Copper Lake, Antig. Co.—A vein of spathic iron carrying chalcopyrite and pyrite, and sometimes as much as 11 ft. in thickness, occurs here at or near the contact of Devonian slates with diorite dykes. A sample of the spathic ore was found to contain 73.68 per cent. of carbonate of iron equivalent to 35.57 per cent. of metallic iron. Further particulars of this deposit will be found under copper ore, No. 72.

HUBNERITE

The most important ores of tungsten are scheelite or tungstate of calcium, wolframite, which consists essentially of tungstate of iron, and hubnerite, which is essentially a tungstate of manganese. The last mentioned ore has been found near Emerald, Inv. Co., and scheelite occurs associated with a little arsenopyrite and pyrite in a quartz vein intersecting the main auriferone vein at the Ballou or Old American mine, Malaga gold district. The addition of tungsten to steel produces properties about identical with those produced by molybdenum, 9 p. c. of the former producing the same effect as 4 p. c. of the latter.

124. HUBNERITE (Manganese Tungstate). Tom Murphy's Brook, off Big Brook, branch of N. E. Margaree River, near Emerald, Inverness Co.—This mineral was discovered in a ravine at this locality in the autumn of 1898, distributed irregularly through a mass of grayish-white quartz weighing about a ton and a half, at the outcrop of a lenticular vein of similar quartz of some 2½ to 3 feet in width, cutting a red gneissic or granitic rock of Pre-Cambrian age. The detached mass afforded 300 to 500 pounds of dressed material. The vein contained but little of the mineral and apparently only for a few feet in. An analysis made by the Geological Survey from selected material was as follows

Tungsten trioxide	74.28
Molybdenum trioxide	Trace.
Manganous oxide	27.73
Ferrious oxide	0.47

Lime	0.02
Magnesia	0.86
Silica	1.33
	99.69

This ore brings a very high price, and is used as an alloy for steel. See *Rept Geol. Sur. Can.*, vol 11, p. 10 R., *Jour. Mining Soc. N. S.*, v., 31 ; *Trans. N. S. Inst. Sc.* x 88 245.

MANGANESE ORES

The ores of manganese found in Nova Scotia are noted for their purity. They occur in the limestone series of the carboniferous at a number of places in the province The best known locality extends from Tenny Cape to Walton, in Hants county. Here a very rich and pure ore has been worked at intervals for a number of years. At one time the price realized was as high as $130 per ton. The ore occurs in strings and pockets in limestone at its contact with the underlying Devonian sandstone. In this county the surface indications along the contact are extended over a large tract of land, but at present little work is being done. Similar ores are met at Onslow, and Manganese Mines near Truro, and at Lock Lomond in Cape Breton county, but have not been mined to any extent. A more recent discovery was made near New Ross, Lunenburg county. There the deposits are described as being of good value, but are at present too far from water and railway communication to permit of shipment economically. There are indications of the ore in a great many other places, but the deposits seem to be too small to work.

PYROLUSITE

125. PYROLUSITE. Fred Shipley mine, about half mile west of Brookdale, Cumb. Co.—This deposit, which occurs in carboniferous limestone, was discovered about 1896. A pit about 20 feet deep was sunk on it, and a number of tons of ore shipped. Edward Curran and W. O'Neil are reported to own the deposit

126 PYROLUSITE John S Archibald's mine, Manganese Mines near Valley Station, Col. Co.—First worked about 1881 by D. Archibald and A Carter. Three timbered shafts are on the property, the last having been sunk in the fall of 1902, but no work is at present being done. Boiler, engine, pump and riddles are at the mine Picked ore from here has sold for $80 a ton, but average price was about $60. The ore occurs in a dark red sandstone of Devonian age

127 PYROLUSITE. George E Boak's property, Tenny Cape, Hants Co—This deposit has long been known and has supplied a

large proportion of the very fine fibrous ore which has been shipped from the province, and which at times has brought very high prices. The ore appears to be principally connected with red and grey limestone, dolomitic in composition, at the contact of the Carboniferous Limestone with Devonian sandstone. The mineral occurs in irregular nests or pockets, and in seams eroded on the bedding planes and cross fractures. It is chiefly a fibrous pyrolusite with splendent lustre, based on a compact or granular ore consisting of pyrolusite, psilomelane, and manganite, the latter not in large quantity. Many tons have been shipped, yielding as high as from 88 to 95 per cent. of available oxide of manganese. The annual production here has seldom exceeded 200 tons, most of which, it is said, is used by glass-makers. One pocket produced no less than one thousand tons of ore. The mine at present is closed, a little surface work being occasionally done. Further information regarding this mine will be found in most works dealing with the economic minerals of the province.

128. Pyrolusite. John Wright's prospecting pits, Minasville, Hants Co.—This ore, like others of the district, occurs at or near the contact of the carboniferous limestone and Devonian formations, and is on the strike of the Walton and Tenny Cape mines.

129. Pyrolusite. Wm. F. Stephens' mine, Walton, Hants Co.—Mr. Stephens, who has long been engaged in manganese mining in the province, has recently been developing this property and marketing an excellent grade of ore, much of it being of the fine fibrous kind. The shipping facilities are good. Like similar deposits in this section it occurs at the contact of the Lower Carboniferous Limestone with the Upper Devonian sandstone.

130. Pyrolusite. Late G. W. Churchill's property, Walton, Hants Co,—Very fine manganese ore occurs here, and the above remarks regarding the Tenny Cape ore will apply generally to this deposit. The deposit is just now unworked.

131. Pyrolusite. Mr. Cullough's property, Walton, Hants Co.—Only prospecting work has so far been done at this spot, the conditions being similar to the other deposits of this vicinity.

PSILOMELANE.

132 Psilomelane and Pyrolusite. Burgess Bros., mine, Cheverie, Hants Co—The ore here seems to be of a mixed character, the greater part of this sample being psilomelane.

MANGANITE.

133. Manganite. New Ross Manganese Co.'s mine, Wallabach Lake, north of New Ross, Lun. Co.—This interesting deposit occurs as a fissure vein in granite. It is

opened up by a shaft and levels, and a good deal of ore was shipped two or three years ago. The long haul to Chester Basin, the nearest railway and shipping point, is a detriment to its being marketed economically, although the deposit seems to be extensive, At the mine this manganite is spoken of as either "brown ore" or "blue ore," the latter possibly being mixed with braunite. The following analyses will show the quality of the ore:—

	"Brown ore."	"Blue ore."
Metallic manganese	61.60	60.54
Manganese dioxide	46.37	70.50
Iron	81	77

Pyrolusite is said also to occur here.

UMBER.

134. UMBER (Oxides of Manganese and Iron). Charles H. Mills' property, Chester Basin, Lun. Co.—The occurrence of an excellent umber at this place has long been known, and a number of years ago R. D. Clarke, of Halifax, manufactured a durable color therefrom, which was sold under the name of Ferro-Metalic Paint. It has been known to stand on the outside of wooden buildings for forty years. It is formed from the decomposition of an impure lower carboniferous limestone, consisting of carbonate of lime, protoxide of iron, oxide of manganese and magnesia, with bitumen or organic matter, pyrite and sand. The decomposed rock, or umber, consists of hydrated peroxides of iron and manganese with very small amounts of lime and magnesia. Other similar deposits have been opened up in the past in the Chester district, where a narrow remnant of carboniferous limestone exists, but this so far seems the most promising one.

FLUORITE.

135. FLUORITE, Green. Cape Rouge, Inv. Co.—Fluorite, or fluor spar is used for metallurgical purposes and also as a source of hydrofluoric acid for etching glass. So far as known it has not been found in sufficiently large deposits in Nova Scotia for commercial purposes.

GYPSUM

Deposits of this mineral are very abundant in the Carboniferous Limestone of the central, northern and eastern counties, and some of the beds are of great thickness. The principal quarries now in operation are near Windsor, Hants Co. It occurs in every variety of structure and purity. There is an export trade to the United States of about 150,000 tons a year, in addition to considerable amounts used locally for fertilizers and for architectural purposes.

136. GYPSUM, VAR. SELENITE. Canfield Creek, near Upper Pugwash, Cumb Co.—This sample is from an unworked deposit of gypsum.

137. GYPSUM. Edward Burgess' quarry, Old Barns, Col. Co

138. GYPSUM. Harbor Road, North River, Antigonish Harbor, Antig. Co.—Large deposits of gypsum occur near Antigonish, and some of them have been worked in the past. The sample is from a bluff on the road side.

139. GYPSUM. Near Dutch Settlement, about 3½ miles N. E. from Elmsdale, Hx. Co.—The quarry, which is about half a mile from the I. C. Ry., with which it was connected by a siding, made some shipments during the summer of 1903. Some very fine selenite occurs here.

140. GYPSUM. Wentworth Gypsum Co.'s Eagle Swamp quarry, Wentworth, Hants Co.—This company has a very large output, which is shipped in the raw state to King Bros. of New York, U. S. A. About 200 men are employed at the quarry. The company owns three locomotives and a railway, 2½ miles long, to its wharf. Besides the Eagle Swamp quarry which is at present worked, the company owns the "Fraser" and "Blue" quarries.

141. GYPSUM ("Blue Plaster"). Wentworth Gypsum Co.'s quarry, Wentworth, Hants Co.—This is merely a bluish tinted gypsum, too dark for white work. When ground it is used as land plaster (fertilizer) for agricultural purposes, and is also employed as an absorbent in stables, slaughter houses, etc.

142. GYPSUM Windsor Gypsum Co.'s (T. A. Mosher's) quarry, one mile northward of Newport Station, Hants Co.—This quarry was opened about 1892, and now has a heavy output, that for 1902 being reported as about 27,000 long tons. It is connected with the Dominion Atlantic Railway and the company's wharf at Windsor. Almost the entire output is taken in the raw state, by the Higginson Manufacturing Company Newburgh, N. Y.

143. CALCINED PLASTER (Plaster of Paris). Manufactured by Windsor Plaster Co. from gypsum of T. A. Mosher's quarry near Newport Station, Hants Co. This company's mill at Windsor is equipped with all machinery for crushing, grinding, calcining and packing this and other products. Although much gypsum is quarried in Nova Scotia and shipped in rock form, this company has probably the only calcining plant at present in the province. The

Plaster of Paris is used in making "putty finish, etc." The company owns gypsum quarries at St. Croix and Ellershouse, which it does not at present work.

144. "SELENITE CEMENT." Manufactured by special process by Windsor Plaster Co., from gypsum obtained at T. A Mosher's (Windsor Gypsum Co.'s) quarry near Newport Station, Hants Co. — The Windsor Plaster Co. has extensive mills at Windsor, which were started about 1891. Selenite Cement is used for undercoating in place of mortar, and has the property of rapidly setting.

145. GYPSUM. Windsor Plaster Co.'s quarry, St Croix, Hants Co. This quarry which adjoins the Hobart quarry, and which is 1½ miles from Newport Station, the nearest shipping point, was developed to some extent by the Windsor Plaster Co. in 1901, when about 4,000 tons of gypsum were quarried. The gypsum is of good quality, but the quarry has been idle while the company has been working the Mosher gypsum.

146. GYPSUM. Windsor Plaster Co.'s quarry, Ellershouse, Hants Co.—This quarry, which is about 1¼ miles from Ellershouse, the nearest shipping point formerly belonged to Mr. Manning. The quarry has been idle while the company has been using gypsum from the Mosher quarry, and is apparently not yet much developed.

147. GYPSUM ("Blue Plaster"). George Redden's quarry, about 2 miles south-east of Windsor, Hants Co. Used by the Windsor Plaster Co. to manufacture "land plaster."

148. GROUND GYPSUM ("Land Plaster"). Manufactured by Windsor Plaster Co., from "Blue Plaster" (gypsum) obtained at George Redden's quarry, 2 miles south-east of Windsor.—This material is largely used as a land fertilizer.

149. GYPSUM. Albert Parsons' (G W Churchill's estate) quarry, Walton, Hants Co.—This is a large quarry, which recently was making extensive shipments being worked under lease by Mr. Parsons. The mineral is shipped by water at Walton.

ANHYDRITE

150. ANHYDRITE ("Hard Plaster"). Wentworth Gypsum Co.'s quarry, Wentworth, Hants Co. This mineral occurs in lenticular masses and beds associated with the soft plaster or gypsum. It is at present put to no use, except occasionally being employed for foundation stones.

LIMESTONE AND MARBLE.

Limestone, which occurs in great abundance, has not been used to any extent in Nova Scotia for building purposes, although it is frequently well suited to that work, and in weathering often assumes various pleasing tones, which should attract the architect. Our limestones, sometimes occurring as marble as at West Bay and other points in Cape Breton, are largely quarried by the iron companies for fluxes. A considerable amount is converted into lime and exported to neighboring provinces.

151. LIMESTONE, Grey. Nova Scotia Steel & Coal Co.'s quarry, Point Edward, near Sydney, C. B. Co.—This company has of late years opened an extensive quarry on this stone which it is using as a flux in its blast furnace.

152. LIMESTONE. Grey. McCabe's quarry, Brierly Brook Antig. Co.—From this well known quarry was obtained the stone from which St. Ninian's cathedral at Antigonish was constructed. It assumes a pleasing warm tint on weathering, which in the opinion of many is an advantage.

153. LIMESTONE. Capt. Ed. Lordley's quarry, Indian Point, Lun. Co.—This lower carboniferous limestone was quarried and burnt for lime in an old flare-kiln for very many years. It is light grey in color and makes a very strong lime, but a little dark. It is said to possess hydraulic properties, which should bring it into notice in the future, as it occurs in large quantity and on tide water, while the new Hx. and Southwestern Ry. passes close to it. The following is an analysis made by the Geol. Survey :—

Carbonate of lime		97.21
" magnesia		.55
" iron		.48
" manganese		.58
Sulphate of lime	.07	1.10
Alumina	.41	
Silica, soluble	.02	
Insoluble mineral matter	.49	
Organic matter	.11	
		99.92

154. LIMESTONE. James Cook's property, Indian Point, East River, Lun. Co.—This stone is from land adjoining Capt. Lordley's, and similar remarks will apply to it.

155. LIMESTONE. Fossiliferous. Ferry Farm, Windsor, Hants Co. This lower carboniferous limestone is being manufactured into lime by J. T. H. Mutler, of Windsor. The sample shows the

highly fossiliferous character of the rock, The following analysis was made by Dr. How:—

Carbonate of lime	97.64
" magnesia	1.10
Oxide of iron	.07
Phosphoric acid	trace
Insoluble residue	.68

156 MARBLE. Marble Mountain, West Bay, Inv Co.—The Marble Mountain deposits are probably the finest beds of workable marble yet found in the province. It contains little admixture of foreign materials, is fairly uniform in texture and of unequalled abundance. The following varieties have been recognized: (a) fine white statuary marble, (b) fine white building marble, (c) coarse white building marble (d) blue and white clouded marble, (e) Brocatello marble, mixed with six varieties of colored marble, (f) fine flesh-colored marbles, often striped and variegated. These marbles are in some cases magnesian or dolomitic. The locality offers every facility for quarrying and shipping. Blocks of large size can be obtained. This deposit, which has attracted much attention, is at present extensively worked by the Dominion Iron & Steel Co. (the owners) as a source of flux for their furnaces at Sydney. A large plant is operated for quarrying and crushing the stone. The quality of the stone should improve with depth. The marble of the locality has also been burnt and furnishes an excellent lime. The sample shows one of the varieties of building marble, as used in a dwelling recently erected at Halifax.

157. MARBLE Ground. From Marble Mountain, Inv. Co., stone, ground by Messrs. Henderson & Potts at the North West Arm, Hx. This marble was ground in order to test its suitability for the manufacture of paint.

158. MARBLE, White. E. T. Bown & Co., Eskasonie, C. B. Co.—This excellent marble was awarded a prize at the Paris Exhibition of 1900. The property has been little developed. Shipments can be made within 400 or 500 yards of the deposit. The sample shown is from the surface.

159. MARBLE Veined. Robie D. Kirkpatrick's property, near Kirk's Hill, Parrsboro, Cumb. Co.—This is an exceedingly fine-grained marble susceptible of a high polish, and if found in sufficient quantity and free from shakes, would make an excellent ornamental stone. The deposit has not been worked, and the sample is from the surface.

160. MARBLE Brecciated, Red. Walton, Hants Co.—The unusual colors and brecciated character of this stone has attracted the attention of all who have seen it in the polished state. If it proves to be in sufficient quantity and unshattered it would doubtless find a

ready sale. The deposit was owned by the late G. W. Churchill, of Hantsport, but little or no work has been done to develop it.

161. MARBLE, White, Veined. Late G. W. Churchill's property Walton, Hants Co.—This stone seems to be of good quality.

DOLOMITE.

Dolomite, or magnesian limestone, of good quality, occurs in various parts of the province, and large deposits are at George's River, Cape Breton Co., Cape Dauphin, Victoria Co., and Whycocomagh, Inverness Co., and at the two first named places it is largely quarried for use by the iron and steel companies. The crystalline varieties are known as marble as well as the non-magnesian crystalline limestone, and for architectural and ornamental purposes little distinction need be made between the two. At George's River some of the stone is varigated with greenish and yellowish serpentine, forming dolomitic ophiolite or verd-antique marble.

162. DOLOMITE. McDonald farm. Stewartdale, about three miles west of Whycocomagh, Inv. Co.—The stone is nearly pure white rather coarsely crystalline and was quarried for a couple of months during the summer of 1903 by Messrs. Henderson & Potts, to be ground and tested for paint making.

163. DOLOMITE, Ground. From Stewartdale (Whycocomagh), Inv. Co., stone ground by Messrs Henderson & Potts at the North West Arm, Hfx.—In 1903 this firm ground some of this mineral to test its qualities as a paint constituent. One objection was its great hardness, which caused it to rapidly cut away the metal teeth of the cone-mill, through which it passed before going to the stones.

164 DOLOMITE. Catalone Lake, C. B. Co.—This deposit is owned by T. Routledge, of Sydney and is 2½ or three miles from the railway. It is of a dark grey color. It is reported to be excellent for metallurgical purposes. One analysis gave the following composition:—

Silica	1.25
Iron	.71
Manganese	.63
Alumina	2.08
Lime	57.64
Magnesia	37.80
	100.11

165. **Dolomite.** **Dominion Lime & Quarry Co.'s quarry, ½ mile from Cape Dauphin, Vict. Co.**—This stone is of good quality and has been tested for metallurgical purposes by one of our iron and steel companies.

BARITE.

This mineral or "barytes" as it is also called, is frequently met in the province and an annual production has been maintained for a number of years averaging from 700 to 800 tons. The output has been used locally in the manufacture of paints and enamels. At present it is mined at Lake Ainslie, Inverness County, although it was formerly worked at Five Islands, Middle Stewiacke, River John and Cape Rouge.

166. Barite. Eastern Milling Co.'s property, Cape Rouge Inv. Co.—This deposit produces excellent barite very free from color. It was worked lately and the mineral ground for use in paint making by Messrs. Henderson & Potts, of Halifax, and by the Eastern Milling Co., late of Dartmouth, but now of Montreal, the latter also using a bleaching process. A sample of the bleached ground mineral is shown as well as unbleached ground, the latter made from "off colour" material.

167. Barite Ground, Bleached. From Cape Rouge, Inv. Co. barite, grounded and treated by Eastern Milling Co., late of Dartmouth. This sample shows the ground mineral after it has gone through a bleaching process consisting of an acid treatment, thorough washing and drying. By this means a second grade product can be turned into one of good color. A good deal of care has be to taken in this process to guard against the formation of secondary chemical substances which might be undesirable in the final product.

168. Barite. Eastern Milling Co.'s McDougall mine, east side of Lake Ainslie, Inv. Co. The samples show the raw and ground mineral, the latter being both bleached and unbleached.

169. Barite Ground, Unbleached. From Lake Ainslie and Cape Rouge, Inv. Co., barite, ground by Eastern Milling Co., late of Dartmouth.—This is made from "off color" material.

170. Barite Ground, Bleached. From Lake Ainslie, Inv. Co., barite, ground and treated by Eastern Milling Co., late of Dartmouth.

171. Barite. Johnston mine, eastern side Lake Ainslie, Inv. Co.—This ore is or was lately shipped to Halifax by Messrs. Henderson & Potts and ground for use in paint making. The

deposit is said to be fairly extensive, and is worked intermittently according to demand. It is hauled some miles to Whycocomagh and there shipped. The samples also show Messrs. Henderson & Potts ground barytes from this locality.

172. Barite, Ground, Unbleached. From Lake Ainslie, Inv. Co., barite, ground by Messrs. Henderson & Potts at the North West Arm, Hx.

173. Barite. South Branch, Black Brook, near Springhill, Cumb. Co.—The barite at this locality occurs in narrow veins from about ½ to 5 inches in diameter, and so far has not been found in quantities sufficient to make it of economic importance.

174. Barite. A. R. Bayne and W. A. & J. C. Soley's mine, on Bass River, 1½ miles north of Five Islands P. O., Col Co.—This property has furnished some fine cabinet specimens, as well as a large quantity for commercial purposes, and it has been estimated that about 30,000 tons must have been extracted from the various tunnels. The property has been idle for a number of years, owing, it is said, to former complications in the title, but preparations are being made to reopen the workings. In 1849 Geo. Duncan, an Englishman then residing in Pictou obtained a tract of land here with the intention of working the barite, but he died in 1851, and it was not till 1861 that it was prospected by Wm Messmore, of New York. In 1867 Wm. J. Prendergrast and associates, of St John, N. B., operated there under lease from C. D. Archibald, part owner. A complication of interests in the property caused Mr. Prendergrast to abandon it, and in 1871 Copeland & Daniels, of Chelsea, Mass., attempted to work under a lease, but for similar reasons ceased operations. In 1871 Bissick & Co., pigment grinders, started works at Five Islands. Subsequently J. R. Henderson and C Potts conducted the works until about 1876, when they removed to Halifax. Bissick and Henderson & Potts mined under lease from the Dolphin Mnfg. Co., and also purchased barite from other lessees. Between 1903 and 1906 Mr. Bayne and associates consolidated all the interests and became sole owners.

175. Barite. J. H. Sellar mine, Hodson, 5 miles from River John, Pict. Co.—This mineral occurs in veins and pockets in Permian sandstone, the zone of veins being, it is said, about seven feet wide and extending for some distance. It was first prospected by Mr. Prendergrast, about thirty years ago who worked it for a couple of years and took out and shipped about 480 tons, valued at $2,400, to Portland, Me., by way of River John. About 1900 Mr. Patrick sank a new shaft and took out a few tons, but did not ship. Two shafts are on the property, but they are just now idle although it is understood they have passed into the control of A. R. Bayne and W. A. and J. C. Soley who expect to operate the mine.

SALT.

This mineral occurs as brine at numerous places in the carboniferous limestone series, and as lenses and particles of crystalline salt in some of the gypsum quarries. The favorable conditions that occur for the deposition of salt after the formation of large beds of gypsum such as occur in the province, have led to the hope that beds of the former mineral will yet be located by boreholes. As the consumption of salt in Nova Scotia is large, the discovery of such deposits would be of great importance. Among other places, brine springs occur at Antigonish, Ohio, Walton, Springhill, Whycocomagh, Baddeck, etc. Brine has also been encountered in two boreholes recently put down in search of oil at Chevrie. A number of years ago an evaporating plant was erected at Antigonish and manufactured salt for a short while. Salt has also in the past been made at Springhill.

176. BRINE. Nova Scotia Oil and Gas Co.'s bore-hole, Cheverie, Hants Co. — About 1903 two bore-holes were put down here in search of petroleum, one to a depth of 1875 ft.* and the other to 2100 ft. They did not succeed in their initial object, but a large flow of brine was met in both holes. In No. 1 hole at a depth of 1000 ft. there was a flow of brine, and at 1800 ft. and 1870 ft. there was encountered a flow of 17 per cent. brine, 95 per cent. of the solids being sodium chloride (salt). In No. 2 hole at 700 ft. brine was met, and at 1400 ft. was encountered a flow which produced about 1 quart of salt to a gallon, equalling a 25 per cent. brine.

DIATOMACEOUS EARTH.

Deposits of diatomaceous or infusorial earth are common in lakes and swamps in many parts of the province, and have been worked at Bass River, Colchester county, and at St. Ann's, Victoria county. The material is used for polishing purposes (electro-silicon), as a non-conducting material, for making soluble silica cement (soda silicate) and also sometimes as an absorbent medium in the manufacture of dynamite. For the latter purpose it must contain a minimum of sponge specules, which are common in some of our deposits.

177. DIATOMACEOUS EARTH (Tripolite). Fossil Flour Co., Bass River, Col. Co.—This company for some years has been preparing for the market a large deposit of diatomaceous earth occurring in the bed of Bass River Lake. The samples show two qualities.

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* The Mines Report gives the depth as 1,910 ft. See also Rept. Geol. Survey of Canada, 1903, p. 391.

TALC.

178. **Talc, var. Soapstone.** Soapstone "mine," Brigend Brook, about 3 miles from Whycocomagh, Inv. Co.—This deposit was worked about 1896 by R. P. Fraser and also possibly by others. The stone was obtained from a shaft on the side of the road, and a quantity of material extracted. It is now unworked.

PYROPHYLLITE.

179. **Pyrophyllite.** Soapstone Brook, Landing Cove, Gabarus Bay, C. B. Co.—This stone, usually spoken of as a soapstone, has received considerable attention and has had its extent tested, but it has not yet been put to commercial use. It is understood to be now the property of a United States company.

PETROLEUM.

Indications of petroleum have been observed at Lake Ainslie in Cape Breton, and at Cheverie, Hants county, and some work has been done to test its presence in quantities of commercial value.

180. **Petroleum** in Gypsum. Burgess Bros.' plaster quarry, Cheverie, Hants Co.—The presence at this vicinity of oil permeating the gypsum has been known for a number of years, and has led many to think that a workable deposit of petroleum exists in connection with the underlying strata (shales), which are the equivalents of the oil-bearing Albert shales of New Brunswick. It remains to be proved if this is the case, or whether the petroleum which has been derived from these rocks has been able to pass off without accumulating in large deposits. During 1903 extensive boring operations were carried on at this place by the Nova Scotia Oil & Gas Co. Two holes 1875 ft and 2100 ft deep failed to strike a deposit. Brine in quantity was met in the holes of good strength, which might be utilized for the manufacture of salt, if the flow continues strong.

BUILDING STONE, GRINDSTONE AND CEMENT.

(See also Limestone and Marble)

The principal stone used for structural purposes in this province is either sandstone (freestone) or granite. There are several excellent varieties of the former, passing from a very light fawn to a purple red colour. The principal quarries are along the Strait of

Northumberland from Merigomish in Pictou Co. to the Joggins in Cumberland county. These quarries are situated near railway and water transport, and are worked to a considerable extent. Freestones are also quarried intermittently in Cornwallis, near Hantsport, Kennettcook, and in Cape Breton. The Midstone Grit likewise has been drawn upon for a yield of building material

Granite is very abundant among the older rocks of the province along the Atlantic coast. It has been quarried extensively near Halifax and Shelburne and to a less extent in the vicinity of Guysboro. A very fine quality occurs at Nictaux, Annapolis county. In the Cobequids there are masses of flesh and red-colored syenites, etc., which have yielded handsome polished specimens. Similar stones are found in various parts of Cape Breton.

Metamorphosed slate, locally known as "iron-stone," is quarried in the vicinity of Halifax for use as flagstones and for building purposes for which rectangular fracture renders it suitable.

SANDSTONE.

181. SANDSTONE. Daniel McLean's quarry, Hardwood Hill, Sydney, C. B. Co.—Used locally for foundations and also in a few instances for trimmings.

182. SANDSTONE, VAR. FREESTONE, Red. Amherst Redstone Co. (J. Donald quarry), Amherst, Cumb. Co—This quarry has been opened about seventeen years and now has a face of about 60 feet. Its area is about 150 x 150 feet. From 20 to 40 men are employed, and the stone is worked by steam derricks, Rand drill and Ingersol trencher. The stone, which has gained much favor, has been marketed from Halifax to Toronto, and also in Massachusetts. The Roy building, Halifax, is built of it, as is also the new Halifax customs house.

183. SANDSTONE, VAR FREESTONE, Greyish-brown. Edward Curran's quarry, Amherst, Cumb. Co.—This quarry was opened in the spring of 1902 and now has a face of about thirty-five feet

184. SANDSTONE, VAR. FREESTONE, Reddish Oakley Myers' Northport Redstone quarry, Cold Spring Head, Amherst Shore Cumb. Co The face of this quarry is about 35 ft deep and 100 ft. long. The stone is lightered to Pugwash, where Mr. Myers has a storage yard. Average price per ton about $4.50 on board car at Pugwash The post office at Springhill is entirely constructed of this freestone, and it is also used in some portions of the Royal Bank at Sydney and of the new custom house at Halifax.

185. SANDSTONE, VAR. FREESTONE, "Olive" and "Blue." The Wallace Stone Co., Wallace, Cumb. Co.—This well-known quarry was opened about fifty years ago by William McNab. It was

afterwards operated by the Wallace Huestis Greystone Co. With it is now incorporated a quarry opened about 1885 by Mr. Battye, afterwards known as the Sherwood quarry. The Wallace Stone Co. is sole owner and operator of all quarries in Wallace and vicinity producing what is known as Wallace stone. The stone is fine grained and of the best quality, fully equal to the best architectural sandstone produced in other countries. It has been accepted by architects as a standard of quality, and where sandstone is used in construction Wallace stone "or stone of equal quality" is usually specified. The price of dimension stone is about $5 a ton. The area of the quarry which has been worked is from four to five acres. The rock face is about 50 feet deep, and the bedding is nearly horizontal. The company is now engaged in filling contracts which will take all the stone that can be produced, with the present facilities, for two or three years. One of the largest of these contracts is for sandstone for the new Royal Victoria Museum building, Ottawa. It is understood that Wallace stone was specified for this building after an inspection by the Dominion government of all the important sandstone quarries of Canada. The company has large orders for American markets, it being used for buildings as far west as Chicago. The stone is also in demand for such public works as bridges, railways, breakwaters, ballasting etc., and is reported to be superior to most stones in withstanding the effects of salt water. Stone is now being supplied for building the Souris and Summerside breakwater, a work requiring 100,000 tons. During the summer of 1906 the company put in an entirely new plant, and built two miles of railway connecting with the Intercolonial Railway. It has also built a double track gravity tramway to its wharves on Wallace Harbor.

186. SANDSTONE, Red. Campbell's quarry, Tatamagouche, Col. Co.—This Permian sandstone has been used locally and for railway work, but is said not to stand well where effected by water and frost.

187. SANDSTONE, VAR. FREESTONE, Grey. W. Gammon (now H. C. Reid's) quarry, River John, Pict. Co.—This quarry, which is situated on the bank of River John and about a mile from the village, was opened about 1901. The stone is shipped at Fitzgerald's siding Intercolonial Ry., near by. Face about 14 high and 300 feet long. The dimension stone sells for about $5.00 per ton.

188. SANDSTONE, VAR. FREESTONE, Brownish. Wm. Gammon's quarry, River John, Pict. Co.—This is close to the Gammon greystone quarry, and was opened about 1890 Similar remarks apply to both.

189. SANDSTONE, VAR. FREESTONE, Grey. Pictou Quarries Co.'s quarry Pictou.—This well-known quarry is about 1½ miles from the centre of Pictou town. The stone is shipped by rail and water at Pictou, and generally sells for about $8.00 per ten for dimension

blocks. The output for the last twelve months was 30,000 tons. Chief markets are Nova Scotia and Prince Edward Island, and and has been used in many buildings of note. One block of stone actually quarried measured 40 x 6 x 6 feet and weighed 115 tons. The face is 55 feet deep. Opened about 1878 by McKeen & Hogg. An analysis of the stone is as follows :—

Silica	74.97 p. c.
Alumina	10.27
Iron oxide	7.02
Lime	2.42
Manganese	.31
Magnesium	2.70
Water	2.31
Organic matter	trace
Total	100.00
Specific gravity	2.63

190. SANDSTONE, VAR. FREESTONE, Red. R. E. Chambers' quarry, Toney River, near Seafoam, Pict. Co.—Quarry opened by Mr. Chambers about 1880, but active operations were only commenced about 1901. The stone is shipped at the quarry wharf on Toney River and at Rogers' siding, Oxford-Pictou branch Intercolonial Ry. The year's output for 1902 was about 700 tons ; average price for dimension stone, $5.00.

191. SANDSTONE, VAR. FREESTONE, Grey. W. R. McKenzie's quarry, near Stillman, Six-mile Brook, off West River, Pictou Co.—Quarry opened about 1890 by Robt. Elliott, and then passed to Fraser & Cunningham. The stone is of an exceedingly fine grade and is sold chiefly for monuments, the price being about $8.00 per ton. It is worked by "plug and feather." Shipment by water is made at Pictou, and by rail at West River Station, both long hauls from the quarry.

192. SANDSTONE VAR. FREESTONE. Brenton Beckworth's quarry, Kelly Brook, Kellyville, about 3 miles from Hantsport, King's Co. —This quarry furnishes a building stone which is a good deal used locally, and was employed as trimmings for the Middleton schoolhouse erected in 1903. About 300 or 400 tons were quarried in that year.

193. SANDSTONE, VAR. FREESTONE. Brownish. Late G. W. Churchill's property, Walton, Hants Co.

GRINDSTONE AND SCYTHE-STONE

194. GRINDSTONES. Atlantic Grindstone Co., Lower Cove, Cumb. Co. This quarry, has produced grindstones since 1790, and they are of a very superior quality. Many years ago the output

was sometimes 5,000 tons annually. The present company bought the property from R. L. Hibbard in 1901, and erected a large new plant including 6 gang saws for cutting stone into different widths, turning lathes for finishing, tram cars, etc. This plant has a capacity of 10,000 to 15,000 tons annually. The company owns 300 acres and the quantity of stone is unlimited. Some of the best grits are quarried under the tide at low water. The stone is extracted by open quarrying, but it is proposed to undermine as is done in other places with success where the cover is heavy. Grindstones are made by the company from 5 pounds to 4 tons in weight. A large part of the output has been exported to the United States. Machinery is to be installed to manufacture oil-stones, scythe-stones, kitchen-stones and whet-stones.

195. GRINDSTONE. Quarry Island, Merigomish Harbor Pict. Co.—Grindstones are quarried here to some extent and marketed in the neighboring counties.

196. SCYTHE-STONE. Lower Cove, Cumb. Co.—It is reported that scythe-stones are not at present manufactured here, but were recently. The stone is well adapted for such use.

197. SCYTHE-STONE. Near Crow Harbor, Chedabucto Bay, Guys Co.—This is a quartzose, schistose rock of the gold-measures, which at this locality readily splits into long prisms, and in this somewhat rough form is marketed in the surrounding districts of Guysborough and Antigonish counties. It is said to be well suited for the use to which it is put.

GRANITE.

198. GRANITE, Red. Cape Breton Red Granite Co.'s (H. F. McDougall's) quarry, Barachois Station, foot of Boisdale Hills, C. B. Co.—This stone has been so far used only in crushed form as "McAdam" for roads, and as such has been very largely utilized in the neighboring towns. Two steam crushers are in use and from 15 to 20 men employed when stone is being taken out.

199. GRANITE, Red. Robie D. Kirkpatrick's property, north of Kirk's Hill, near Parrsboro, Cumb. Co.—This specimen is illustrative of the so-called red granite of the Cobequids. It has not yet been quarried for the market.

200. GRANITE. John Kline's quarry, Witherod Lake, North West Arm, Hx. Co.—This well known quarry has been worked for a number of years and a very large quantity of excellent stone has been taken out and used for buildings and monuments. Mr. Kline has an excellent plant at the quarry for sawing, cutting and polishing the stone.

201. GRANITE. Shelburne, Shel. Co.—A large amount of granite exists in this locality and has been quarried and largely utilized in

building and for street paving-blocks. It is of finer grain than the Halifax granite. The Herald Building at Halifax is constructed of this stone.

202. GRANITE. John Kline's quarry, near Nictaux, Annap. Co.—This is a very fine grade of granite which is much used for monumental work. It takes a fine polish, is of a dark color, and shows great contrast when cut.

METAMORPHOSED SLATE.

203. METAMORPHOSED SLATE. The King's quarry, North West Arm Hx Co.—This stone, which is much metamorphosed by its proximity to granite, is a good deal used in Halifax for building purposes and for flag-stones. Many of the older buildings are constructed entirely of it and it has also been very extensively used in the fortifications and other military works. It is locally known as "ironstone."

CEMENT.

204. PORTLAND CEMENT (SLAG CEMENT). Sydney Cement Company, Sydney, C. B. Co.—This company was formed in 1905 and in the same year erected and put in operation a modern plant at Sydney for the manufacture of cement from blast furnace slag obtained from the Dominion Iron & Steel Co. The agreement with the Steel Company calls for any of its slag for 90 years, at the rate of 50c. per ton dry weight, delivered at the cement works. The slag as it flows from the furnace ladles, has a stream of water directed upon it, which granulates it as it drops into a rail-car beneath. It is then taken to the cement works, where it passes through two cylindrical revolving dryers, each about 30 feet long. From there it is conveyed to a hopper, and as it issues therefrom is mixed with about 3 to 5 per cent. of freshly slacked lime, the proportionate feed of slag and lime being regulated by an Evans friction-cone pulley. The united supply of slag and lime passes into a cylindrical revolving mixing (and grinding) mill, about 20 x 5 feet, lined with flint blocks and filled with loose flint pebbles. At the end of this mill a certain amount of refuse is separated and discarded. The material is now elevated and parted into two lots each of which goes through a feed regulator into a final grinding mill, of the same size and construction as the mixing mill, where the material is ground to a great degree of fineness by the flints. From these two grinding mills the finished cement is elevated and goes by automatic conveyors to large storage bins and, as required, it passes by a conveyor and elevator to small hoppers from which it is packed in barrels or stout paper bags ready for the market, where it is sold under the name of "Rampart Brand Cement." The two dryers and three mills have sufficient slant to forward the material from end to end. Two Robb-Mumford boilers and a Robb-Armstrong Corliss engine supply the power for driving the mills, cork-screw conveyors, and bucket-belt elevators. Two Ruggles Coles Engineering Co.'s furnaces furnish heat for the

dryers. The capacity of the plant is estimated to be about 500 barrels in 24 hours, and it was expected that the cement could be manufactured at a cost of about 90c. a barrel. Cement made from this slag at the Stewart Iron Co.'s works, Sharon, Pa., furnished the following results of tests for tensile strength:

Mixture of 3 to 1:	7 days,	175	lbs. per sq. inch.
" 3 to 1:	28 "	298	" " "
Neat cement:	7 "	435 to 465	" " "
" "	28 "	630	" " "

The available market in the Maritime Provinces and Newfoundland is estimated at about 375,000 bbls. a year. The consumption of cement is increasing, as it is now being more used in all kinds of building construction. There is no other cement factory east of Ottawa. This cement has been entirely used in 1906 in laying the foundation for the bitulithic pavement of the Halifax streets. Sidewalks have been constructed of it in Bridgetown and North Sydney and samples of it laid down in the new sewer on Park St., Halifax, while the Maritime Business College, College St., is now being built of it, with the exception of trimmings. It has likewise been used in foundations of the fisheries building, at the exhibition grounds, etc. When mixed with sand and moulded into hollow building blocks it forms a good substitute for cut stone, from which it is difficult to distinguish it. A small structure in the exhibit shows various styles of these blocks, with cornices, mouldings, etc.

CLAY, BRICKS AND POTTERY.

Brick clays are found in many places, the best known fields being those of Shubenacadie, Elmsdale, Avonport, Annapolis, Stellarton, Pugwash, and various places in Cape Breton. When these clays are properly tempered they yield a good and strong brick.

205. CLAY with Baddeckite. Baddeck, Vict. Co.—This clay, when broken apart, shows films of a brownish-red, new variety of mica which was recently described by Dr. Hoffmann of the Geological Survey, and named after the place where it was discovered. The samples have been furnished by Chas. L. Campbell of North Sydney.

206. CLAY AND BRICKS. Mira Brick Co., Mira River, C. B. Co.—Situated about 3 miles from Mira Gut. The clay worked is believed to be the same from which the French made bricks for Louisbourg. The clay bank is said to be 4' feet deep. The top, for about 2 to 4 feet is of red color, while below that the clay is of a bluish tint but burns red. Steam power is used, the bricks dried in the air on "hacks", and fired in ordinary stacks or clamps. The output is lightered to Mira Gut for shipment.

207. "Silicate Brick." (Sand-lime Brick). **Manufactured from North Sydney silica sand and New Brunswick lime, by the late C. B. Silicate Brick Co., North Sydney, C. B. Co.**—The manufacture of these bricks was a new industry in Canada of which much was expected. The bricks were moulded from a mixture of sand and lime and then placed in a steamer where they were subjected to steam at a pressure of 130 lbs. per sq. inch, for from 9 to 10 hours. As a result of this a cement is chemically formed, which under proper conditions is very strong. The bricks can be tinted any color, but the company only produced grey brick of a very pleasing appearance. The process is known as the Oscar Hugo Anderson patent. It is a German invention and the manufacture of similar bricks, as well as building stone, is assuming large dimensions in Germany and Sweden. The Cape Breton company started to manufacture in December, 1902, being the first factory of this kind to operate in Canada. The output with the then plant, was from 6000 to 7,000 per day. The Vooghts building at North Sydney and the theatre at Sydney are constructed of this brick. The company ceased operations a couple of years ago.

208. Clay. Peter McLean's land, Leitche's Creek, C. B. Co.

209. Clay, Sand and Bricks. Maritime Clay Works, Pugwash, Cumb. Co.—This is usually spoken of as the best brick-making plant in the province. About 1889, bricks were burnt here in ordinary stacks or clamps, but in 1900 an improved, permanent, down-draft "continuous kiln" with a capacity of nearly 40,000 stock, and 18,000 pressed brick a day, was erected after plans from Los Angelos, California. The setting of the dried bricks, burning, and removing the finished product goes on continuously. The kiln is oval in shape, containing only one long circuitous chamber, the parts where burning is taking place being ingeniously separated by a partition of ordinary wrapping paper, which is defended from combustion by the course of the drafts until another compartment is filled and ready for firing, when the draft is cast through the partition and destroys it. Coal, fed from above, is used in firing. The pug-mill, wire-cut and other machinery is driven by steam, and the dry-house is steam-heated. The company owns its own locomotive, tip-cars, and narrow-gauge railway to its clay-bank on the Pugwash River. The capacity of the works is said to be 39,600 bricks per day, clear of "smash-ups." The product of these works is very excellent, with a very small per centage of pale or unburnt bricks, and the kiln is being called upon to its full capacity to fill the present demands of the market. The samples show the clay with the sand used as a binder, and five stock bricks as supplied the trade.

210. Sewer Pipes and other Clay Products. Standard Drain Pipe Co.'s factory New Glasgow, Pict. Co.—This company was established at St. Johns, Quebec, in 1884, and in 1903 built a branch factory about 1½ miles south of New Glasgow, N. S., where its clay

bank is situated. It has 60 to 80 employees. The many kinds of clay goods shown are understood to have been made in the New Glasgow works.

211. Clay and Bricks. Eastern Canada Brick and Tile Co., Sylvester, Pict. Co.—The yearly output of these works is between two and three millions. A steam pug-mill is used, and side-cut 6-brick machine. The bricks are dried in air, and burnt in stacks or clamps.

212. Bricks. Chisholm's brickyard, Sherbrooke post-road, near Antigonish, Antig. Co.—This brickyard works intermittently and supplies most of the present demand for bricks in the district.

213. Clay and Bricks. International Brick and Tile Co., Bridgetown, Ann. Co.—The samples shown are pressed brick and the pattern known as "bull-nose," suitable for round corners, widows and door jams.

214. Clay, Pottery, Drain-tiles, Sewer-pipes, etc. James Prescott & Sons' Enfield Pottery, half a mile north-east of Enfield, Hants Co.—James Prescott started his works here, on a bed of superior clay, about 25 years ago. The plant now cansists of a steam pug-mill, pipe and tile-moulding machine, throwing-wheels, drying-house, and a down-draft pottery kiln. The products of the works consist of vitrified sewer-pipe, chimney-tops, farmers' drain tiles, improved vitrified conduit-tiles (for underground telephone and telegraph cables), flower vases, stoneware, earthenware, and modelled terra-cotta work of all kinds. The firm just now is filling a large order for conduit-tiles for the Nova Scotia Telephone Co.

FIRE-CLAY.

Fire-clay is common in our coal measures, and has at various times been manufactured into brick at Stellarton, etc. The Intercolonial Coal Co. of Westville is at present engaged in making fire-bricks from clay in connection with their seam.

215. Altered Felsite (suitable for Fire-clay). Mill Brook, East Branch of Watson Brook, Coxheath Hills, C. B. Co.—Formerly Rev. M. A. McPherson's property, now Graham Fraser's. A series of experiments conducted in the laboratory of the Geological Survey of Canada has shown this material to be well adapted for the manufacture of fire-bricks when mixed with from ½ to 1 per cent. of lime. See *Report Geol. Surv.* 1875-6, p. 423. The following is an analysis of the felsite:

Silica	76.260
Alumina	19.152

Iron oxide	trace
Lime	.555
Magnesia	.170
Alkalies	.259
Combined water	4.300

216. ALTERED FELSITE (suitable for Fire-clay). McIntyre property, Coxheath Hills, C. B. Co.—Contributed by T. Routledge, Sydney.

217. FIRE-CLAY. Acadia Coal Co., Albion mine Stellarton Pict. Co. This clay is directly overlying the 4 ft. seam of coal and is from 30 to 40 ft. thick. It has been utilized in the manufacture of fire-brick, and is said to have given good results.

218. FIRE-CLAY AND FIRE-BRICKS. Intercolonial Coal Mining Co., Westville, Pict. Co.—This fire-clay is mined at the company's Drummond colliery. The company has lately erected a plant for grinding the clay and manufacturing bricks. It consists of grinding and pug-mills, brick-presses, drying-room and kilns of improved type. Most of the ordinary bricks are moulded by hand in wooden forms. Among the articles made are square fire-brick, side-arch brick, circles and wedges for coke-ovens, tiles for Babcock and Heine tubular boilers, fine facing bricks for decorative work, and soap brick.

219. FIRE-CLAY. Shubenacadie, Hants Co.—This clay is shown by Henry Prescott of the Enfield Pottery, who states he has put it through severe tests with satisfactory results.

MOULDING SAND.

Sand, more or less suitable for metal casting, is found in various places in the province, and is used to a small extent locally. Avondale, Pict Co., supplies most of the Nova Scotian sand now in use. For foundry use, the moist sand should have sufficient cohesive power to remain firm when moulded, and for this purpose it should not be pure siliceous sand, but one containing a proportion of such substances as clay and iron oxide.

220. MOULDING SAND. Conn's Mills, Cumb. Co. This sand, which is found near R. Chestnut's farm, about three miles from Conn's Mills station Intercolonial Ry., is controlled by the Amherst Foundry Co., which reports it very good for furnace castings, light machinery work, etc., but not fine enough for stove work. It is sold for $1.25 per ton f. o. b. at Conn's Mills. The deposit is said to be rather shallow.

221. MOULDING SAND. John W. Campbell's land, Salmon River, 2 miles from Truro, Col. Co.—This sand has been tested at Londonderry, and is said to be satisfactory.

222. MOULDING SAND. Murray's sand-bank, Avondale, Pict. Co.—This sand is used altogether for moulding at Fraser Bros. foundry, New Glasgow, and is found to be of good quality. It is marketed in various parts of the province.

223. MOULDING SAND. Dill's farm, near Windsor, Hants Co.—This sand has been occasionally used by the Windsor Foundry & Machine Co.

ROOFING SLATE.

Nova Scotia abounds in slates of supposed Cambrian, Silurian and Devonian age. In some places they have qualities which suit them for architectural use, while in many localities they deserve to be tested for the purpose. So far the only quarries that have been operated to any extent are at East Gore in Hants Co.

224. SLATE. Jas. Murray's farm, South Lochaber, Guys. Co.—This slate, of Devonian age, is probably suitable for roofing purposes. The specimens shown are from the weathered outcrop, the stone not having been worked.

225. ROOFING SLATE. Kellough's quarry, East Gore, Hants Co.—This stone was quarried to some extent for roofing purposes in the past. The East Gore slate has been usually regarded as the best yet worked in Nova Scotia.

226. ROOFING SLATE. Jas. Barron's quarry, East Gore, Hants Co.—This quarry is near Kellough's, and like it furnished a fair amount of roofing slates in the past, but is not now worked.

PIGMENTS.

Hydrated oxides of iron and manganese occur frequently in Nova Scotia. Some small use has been made of them for paints, but the demand is principally met by a cheaper imported article. See OCHRE and UMBER. Barite as a paint material has also been referred to on a previous page.

Among other minerals that are known to occur in the province, but which have not as yet been found in amounts of economic importance, may be mentioned molybdenum, which occurs at North Shore of Gabarus Bay and New Ross, cobalt and nickel, zinc, tin and phosphates.

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